basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 10

GEOGRAPHY P1

EXEMPLAR 2022

MARKS: 150

TIME: 3 hours

This question paper consists of 15 pages.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of TWO sections.

   SECTION A:
   QUESTION 1: THE ATMOSPHERE (60 MARKS)
   QUESTION 2: GEOMORPHOLOGY (60 MARKS)

   SECTION B:
   QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES (30 MARKS)

2. Answer ALL THREE questions.

3. ALL diagrams are included in the QUESTION PAPER.

4. Leave a line between subsections of questions 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 where you have to state, name, identify or list.

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

11. You may use a non-programmable calculator.

12. You may use a magnifying glass.

13. Write neatly and legibly.

SPECIFIC INSTRUCTIONS AND INFORMATION FOR SECTION B

14. A 1 : 50 000 topographic map of 3224BC GRAAFF-REINET and a 1 : 10 000 orthophoto map 3224 BC 01 GRAAFF-REINET are provided.

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

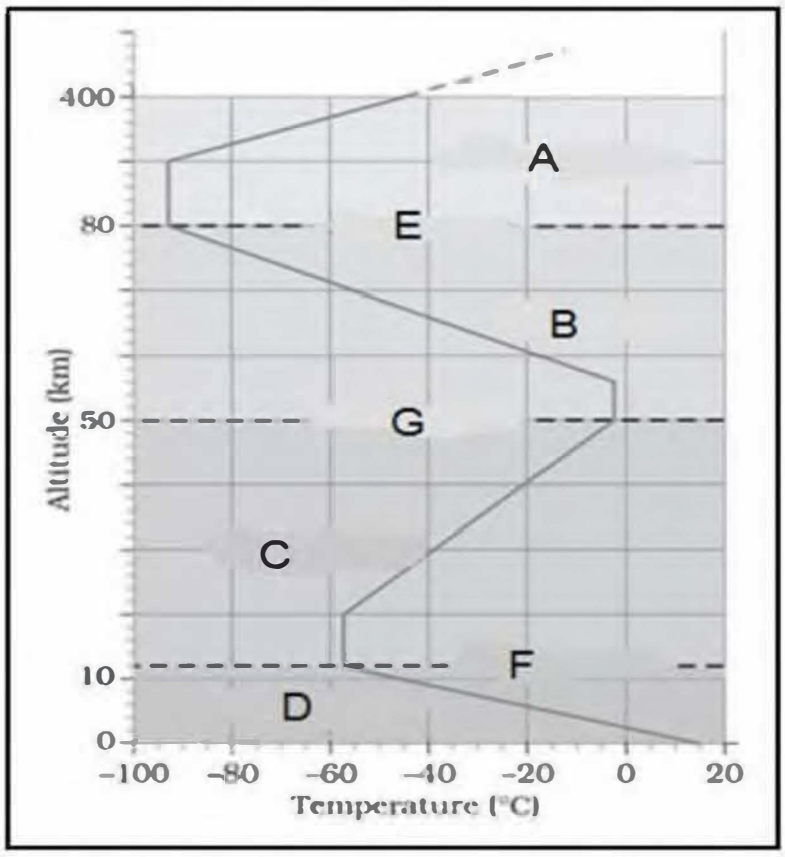
16. Show ALL calculations. Marks will be allocated for this.

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

SECTION A: PHYSICAL GEOGRAPHY

QUESTION 1: CLIMATOLOGY

1.1 Refer to the diagram below which shows the structure of the atmosphere. Match EACH of the statements (1.1.1 to 1.1.7) with the letters (A–F) on the diagram, e.g. 1.1.8 H. You may use a letter MORE THAN ONCE.



[Source: https://byjus.com/free-ias-prep/ncert-notes-structure-of-atmosphere]

1.1.1 Separates the stratosphere and mesosphere

1.1.2 All weather processes occur within this layer

1.1.3 Meteors burn up in this layer

1.1.4 Separates the troposphere and stratosphere

1.1.5 The temperature increases with height

1.1.6 Separates mesosphere and thermosphere

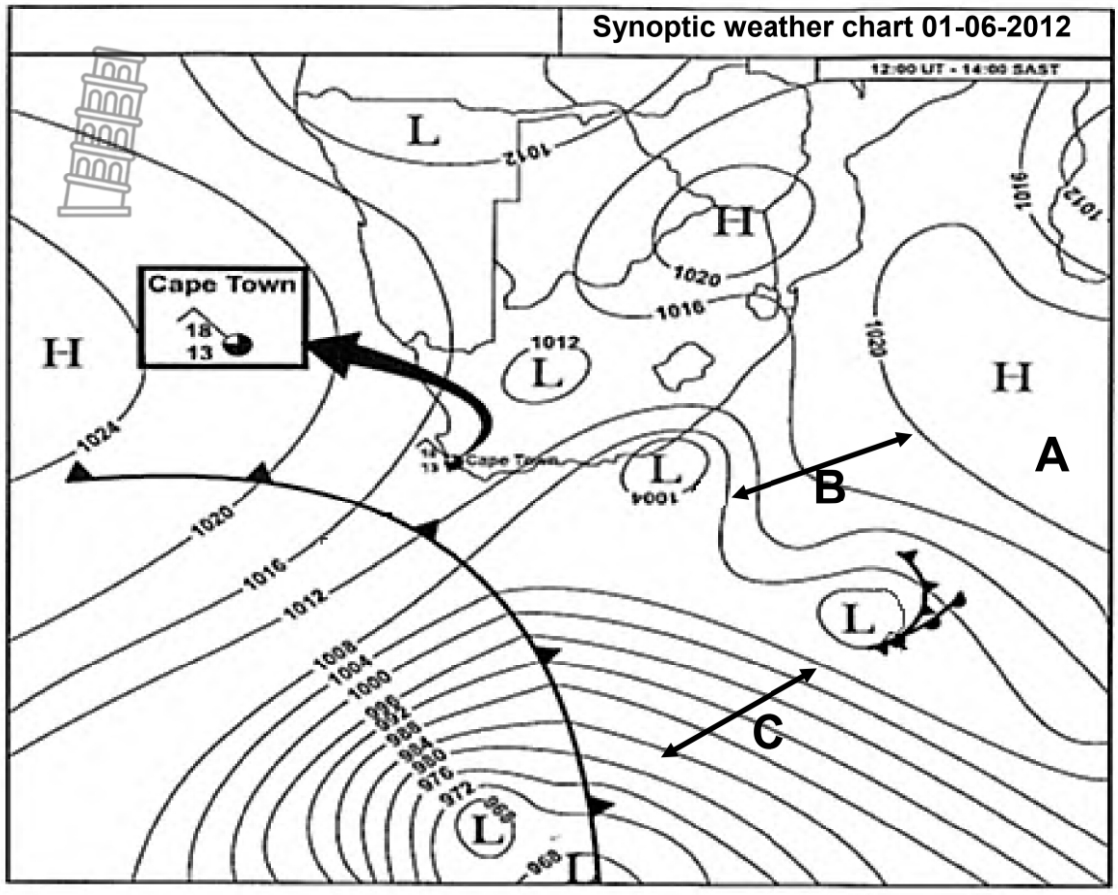
1.1.7 The ozone layer is found in this layer (7 x 1) (7)

1.2 Match the terms in COLUMN B with the descriptions in COLUMN A. Write ONLY the letter (A–I) next to the question numbers (1.2.1 to 1.2.8) in the ANSWER BOOK, e.g. 1.2.9 J. You may use each answer only once.

COLUMN A		COLUMN B	
1.2.1	The category of gases which occur in different amounts at different times	A	convection rain
1.2.2	Refers to the direction a slope faces in relation to the sun	B	insolation
1.2.3	Change of state from gas to solid	C	hygroscopic nuclei
1.2.4	This gas makes up 78% in the atmosphere	D	isotherms
1.2.5	Lines joining all the places having equal temperatures	E	nitrogen
1.2.6	Minute solid particles found in the atmosphere, that forms the nucleus for raindrops to form	F	crystallisation
1.2.7	Type of rain usually found in Gauteng	G	variable gases
1.2.8	The total amount of energy received from the sun	H	oxygen
		I	aspect

(8 x 1) (8)

1.3 Refer to the synoptic weather map below.



[Adapted from https://weathersa.co.za]

1.3.1 Define the term *isobars*? (1 x 2) (2)

1.3.2 Give the isobaric interval of the synoptic weather map. (1 x 1) (1)

1.3.3 Why is cell **A** referred to as a high- pressure system? (1 x 1) (1)

1.3.4 Identify the season represented in the synoptic weather map. (1 x 1) (1)

1.3.5 Give TWO pieces of evidence on the synoptic weather map to support your answer to QUESTION 1.3.4. (2 x 1) (2)

1.3.6 Refer to the weather station of Cape Town (enlarged).

(a) State the main factor that will cause a change in the weather conditions of Cape Town in the next 24 hours. (1 x 1) (1)

(b) Draw the weather station for Cape Town in your ANSWER BOOK, with the following changes:

(i) Air temperature decreases by 14 °C

(ii) Cloud cover increases by $\frac{4}{4}/\frac{8}{8}$

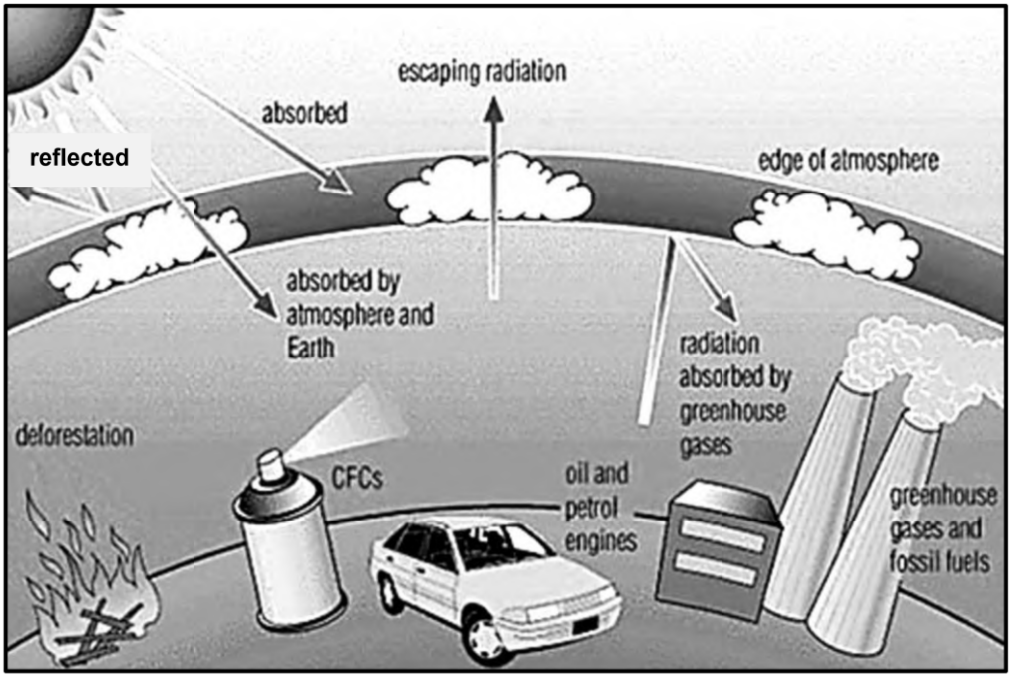
(iii) Wind direction changes to south-west (SW)

(iv) Wind speed increases by 5 knots

(v) Dew point temperature remains constant (5 x 1) (5)

1.3.7 Explain why the wind will generally be stronger in area **C** than in area **B**. (1 x 2) (2)

1.4 Refer to the diagram below which shows greenhouse gases that contribute to global warming.



[Source: https://www.google.com/search?q=global+warming&rlz]

1.4.1 What are *greenhouse gases*? (1 x 2) (2)

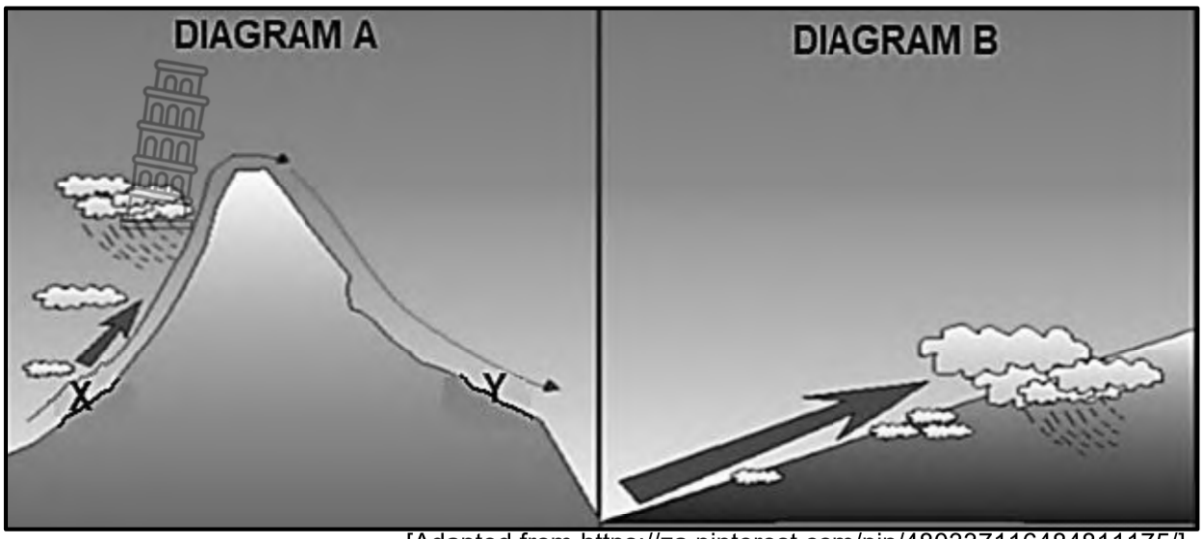
1.4.2 How do greenhouse gases cause global warming? (1 x 2) (2)

1.4.3 Explain how deforestation contributes to global warming. (2 x 2) (4)

1.4.4 Describe TWO consequences of global warming. (2 x 2) (4)

1.4.5 Suggest TWO strategies that people can implement in their daily activities to reduce greenhouse gas emissions. (2 x 2) (4)

1.5 Refer to the diagram below which illustrate types of rainfall



[Adapted from https://za.pinterest.com/pin/480337116484811175/]

1.5.1 Identify the types of rainfall in diagrams **A** and **B**. (2 x 1) (2)

1.5.2 What trigger action caused the development of the types of rainfall in the diagrams **A** and **B**? (2 x 1) (2)

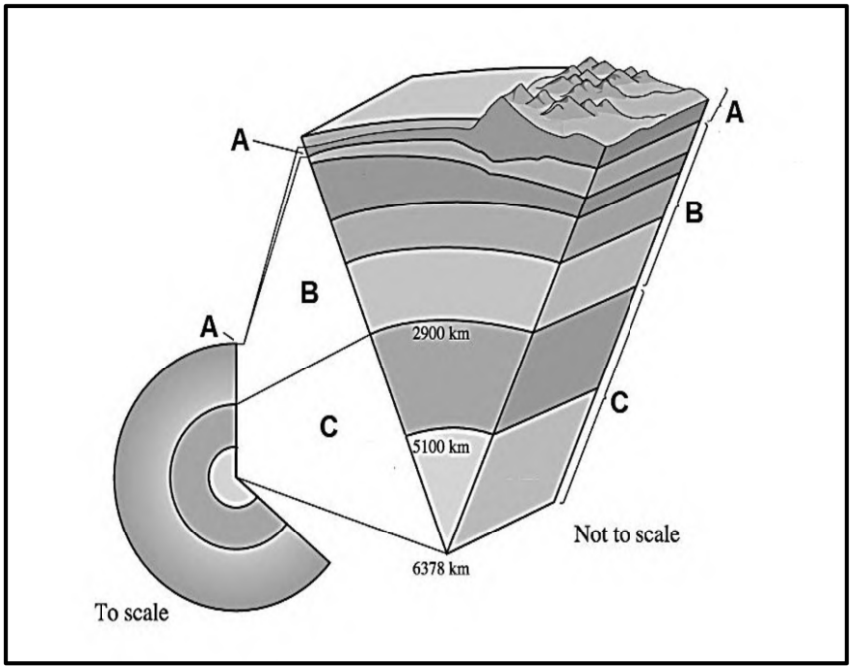
1.5.3 Describe the rainfall occurring in diagram **B**. (1 x 2) (2)

1.5.4 In a paragraph of EIGHT lines, discuss how the rainfall in diagram **A** is formed. (4 x 2) (8)

[60]

QUESTION 2: GEOMORPHOLOGY

2.1 Refer to the diagram below illustrating the internal structure of Earth. Match EACH of the descriptions (2.1.1 to 2.1.7) with the letters (A–C) on the diagram, e.g. 2.1.8 D.



[Adapted from https://www.google.com/search?q=internal+structure+of+the+earth&rlz]

2.1.1 The layer that is made up of iron and nickel

2.1.2 The asthenosphere forms part of this layer

2.1.3 In this layer, the convection currents create the earth's magnetic field

2.1.4 This is the outer layer of the internal structure of the earth

2.1.5 This layer consists of iron and magnesium

2.1.6 The layer is in a molten stage, but too heavy to move like liquid

2.1.7 In this layer, sial and sima form part of the rocks that form (7 x 1) (7)

2.2 Match the statements (2.2.1 to 2.2.8) below with types of rocks. Write only IGNEOUS, SEDIMENTARY or METAMORPHIC next to each question number. Each statement refers only to ONE type of rock, e.g. 2.2.9 Sedimentary.

2.2.1 Is the source of crude oil and coal

2.2.2 Rocks that are formed under very high temperatures and severe pressure

2.2.3 Material deposited in horizontal layers in lakes and seas

2.2.4 Granite domes develop from these rocks

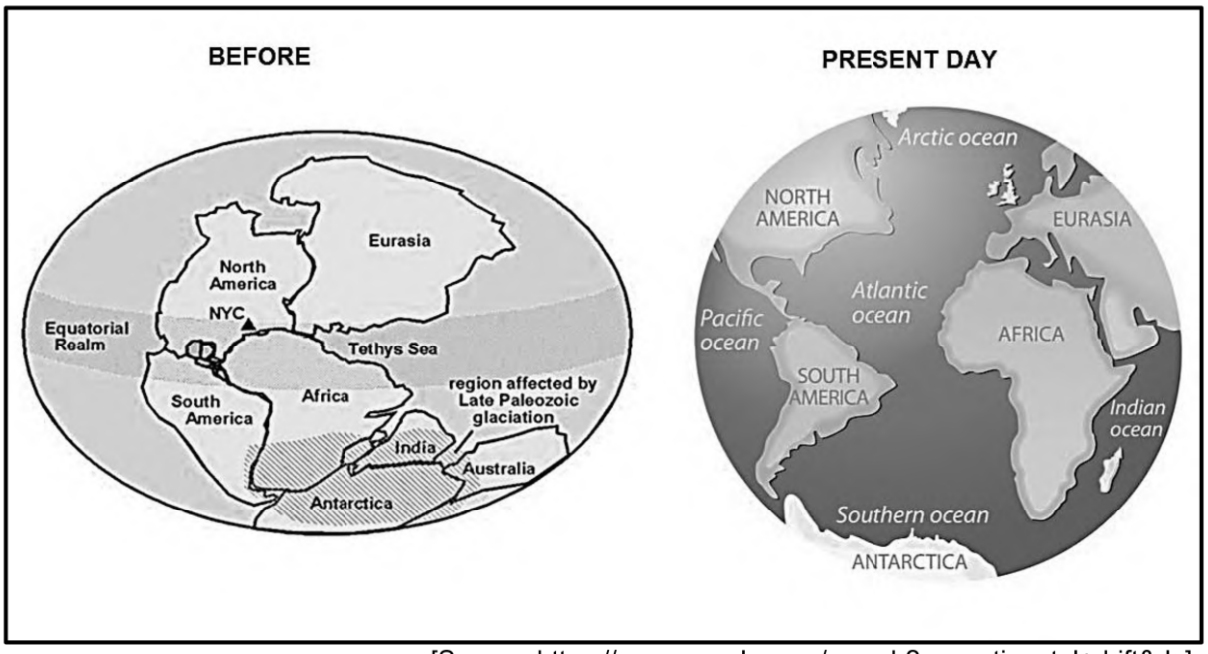
2.2.5 Fossils can be found in these rocks

2.2.6 Forms from molten material

2.2.7 These rocks are used for ornamental purposes like statues

2.2.8 Forms the basalt layer on top of the Drakensberg Mountains (8 x 1) (8)

2.3 Refer to the diagram below illustrating the theory of continental drift



[Source: https://www.google.com/search?q=continental+drift&rlz]

2.3.1 Define the concept *continental drift*. (1 x 2) (2)

2.3.2 Name TWO continents that formed part of Gondwanaland. (2 x 1) (2)

2.3.3 What is the main reason for the drifting of continents? (1 x 1) (1)

2.3.4 Explain what happens at divergent plate boundaries. (1 x 2) (2)

2.3.5 Give evidence that suggests South America and Africa were previously connected. (2 x 2) (4)

2.3.6 How does the theory of continental drift differ from the theory of plate tectonics? (2 x 2) (4)

2.4 Refer to the extracts on earthquakes below.

EXTRACT 1	EXTRACT 2
In a single day on Earth, thousands of earthquakes may occur, but it is the big earthquakes that are usually of interest to people. (An earthquake is considered to be *big* if it has a magnitude of 7.0 or greater on the Richter scale.) These quakes can cause major damage and loss of life. On average worldwide, about 18 earthquakes per year qualify as big. [Source: https://www.usgs.gov/natural-hazards/earthquake-hazards/earthquakes]	**'Wobble' may precede some great earthquakes** New research shows that in the months before the strongest earthquake in the country's recorded history, a 2011 earthquake with a magnitude of 9 on the Richter scale that killed more than 15 500 people, the land masses of Japan shifted from east to west to east again. Those movements that researchers call a 'wobble', may have the potential to alert seismologists to a greater risk of future large subduction-zone earthquakes. These destructive events occur where one of Earth's tectonic plates slides under another one. This underthrusting jams up or binds the earth, until the jam is finally torn or broken and an earthquake results. [Source: https://science.sciencemag.org/content/161/3846/1127]

2.4.1 Refer to EXTRACT 1.

(a) What instrument is used to measure the magnitude of earthquakes? (1 x 1) (1)

(b) Explain why thousands of earthquakes may occur in a single day. (1 x 2) (2)

2.4.2 Differentiate between the *epicentre* and the *focus* of an earthquake. (2 x 1) (2)

2.4.3 Refer to EXTRACT 2.

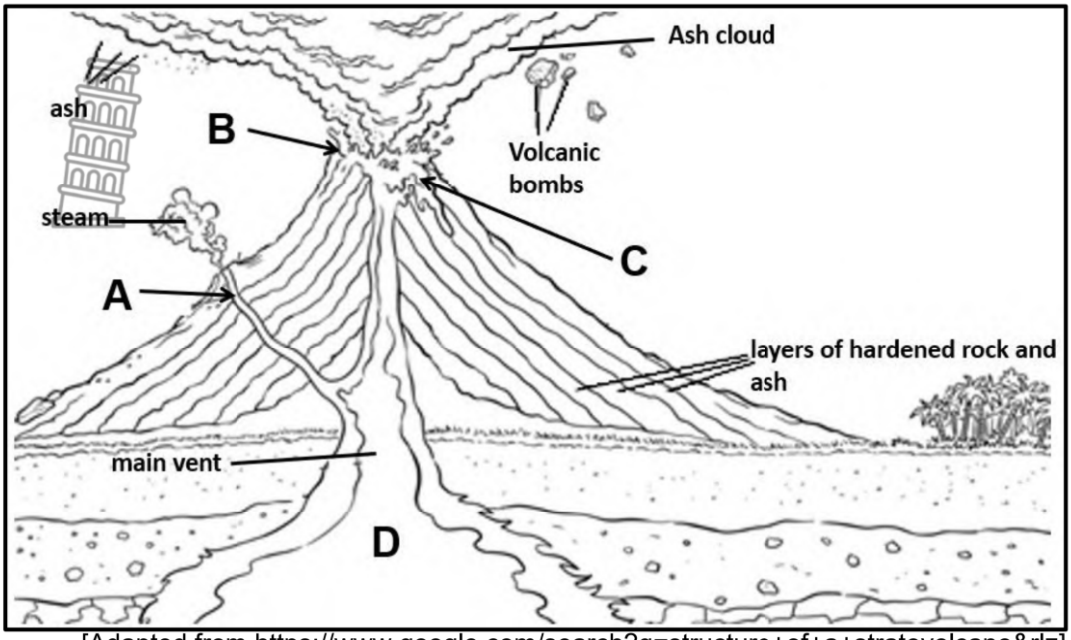
(a) Why is the earthquake in Japan considered to be a 'big' earthquake? (1 x 2) (2)

(b) What is a *wobble* according to the researchers? (1 x 2) (2)

(c) What happens at a subduction zone? (1 x 2) (2)

(d) According to the extract, explain how an earthquake develops. (2 x 2) (4)

2.5 Refer to the sketch below showing a strato-volcano (composite volcano)



[Adapted from https://www.google.com/search?q=structure+of+a+stratovolcano&rlz]

2.5.1 Why can this volcano be regarded as active? (1 x 1) (1)

2.5.2 Give TWO characteristics of a strato-volcano. (2 x 1) (2)

2.5.3 Identify features **A** and **B** of the strato-volcano. (2 x 1) (2)

2.5.4 Name the molten material at **C** and **D**. (2 x 1) (2)

2.5.5 In a paragraph of approximately EIGHT lines, discuss the economic advantages and disadvantages of volcanoes. (4 x 2) (8)

[60]

SECTION B: GEOGRAPHICAL SKILLS AND TECHNIQUES

GENERAL INFORMATION ON GRAAFF-REINET

Coordinates: 32°15'S;24°31'E

Graaff-Reinet is the oldest established town in the Eastern Cape and the fourth oldest in South Africa.

Graaff-Reinet is the main centre of the Camdeboo Municipality (population in 2002, 44 354) and is built in an area known as 'the horseshoe' where the Sundays River makes a loop almost encircling the old town. The town is 750 metres above sea level.

Few towns have conserved their historic townscape as well as Graaff-Reinet, with the result that the town has more protected buildings than any other in South Africa.

In Graaff-Reinet, the summers are hot; the winters are short, cold, dry and windy; and it is mostly clear year round. Over the course of the year, the temperature typically varies from 5 °C to 33 °C and is rarely below 2 °C or above 39 °C.

[Source: https://en.wikipedia.org/wiki/Graaff-Reinet]

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

ENGLISH	AFRIKAANS
River	Rivier
Industry	Industrie/Nywerheid
Clinic	Kliniek
Landing Strip	Landingstrook
Drive-In-theatre	Inryteater
Diggings	Uitgrawings
Weir	Stuwal
Canal	Kanaal

QUESTION 3

3.1 MAP SKILLS AND CALCULATIONS

Various options are provided as possible answers to QUESTIONS 3.1.1 and 3.1.2. Choose the answer and write only the letter (A–D) next to the question numbers (3.1.1 and 3.1.2) in the ANSWER BOOK.

3.1.1 The human-made feature found at 32°17"47'S/24°33'41"E is a …

A school.
B dam.
C landing strip.
D drive-in-theatre. (1 x 1) (1)

3.1.2 The index sheet of the topographic map found south-west of Graaff-Reinet is …

A 3224 BC.
B 3224 AD.
C 3224 DB.
D 3224 CB. (1 x 1) (1)

3.1.3 You are travelling along the **N9** in a south-westerly direction, from **F** in block **C6**.

(a) Name the first town you will reach while traveling in a south-westerly direction. (1 x 1) (1)

(b) Will you be driving uphill or downhill? Give a reason for your answer. (1 + 2) (3)

3.1.4 DISTANCE

(a) Calculate the distance in metres from **1** to **2** on the orthophoto map. Show ALL calculations. Marks will be awarded for steps.

Formula: **Map distance x scale** (3 x 1) (3)

(b) The distance from **1** to **2** on the orthophoto map is the same as the distance from **G** to **H** on the topographic map in reality. Explain why the map distances differ. (1 x 1) (1)

3.2 MAP INTERPRETATION

Various options are provided as possible answers to QUESTIONS 3.2.1 and 3.2.2. Choose the answer and write only the letter (A–D) next to the question numbers (3.2.1 and 3.2.2) in the ANSWER BOOK.

3.2.1 The area encircled at **3** on the orthophoto map is dominated by … functions.

A residential
B educational
C historical
D recreational (1 x 1) (1)

3.2.2 The landform represented by line **I-J** in block **B2/C2** on the topographic map is a …

A valley.
B spur.
C mountain.
D hill. (1 x 1) (1)

3.2.3 Refer to the areas **K** (block **B4**) and **L** (block **E3**).

(a) Which area, **K** or **L**, will generally experience lower temperatures? (1 x 1) (1)

(b) Refer to the answer to QUESTION 3.2.3(a) above and state how altitude could cause this lower temperature. (1 x 1) (1)

3.2.4 Graaff-Reinet receives seasonal rainfall. Give TWO pieces of evidence on the topographic map to support the statement. (2 x 1) (2)

3.2.5 Refer to landforms **L** (block **E3**), **M** (block **C9**) and **N** (block **C9**).

(a) Name landforms **M** and **N** respectively. (2 x 1) (2)

(b) Besides the height difference between landforms **L** and **N**, give TWO other differences evident on the topographic map. (2 x 2) (4)

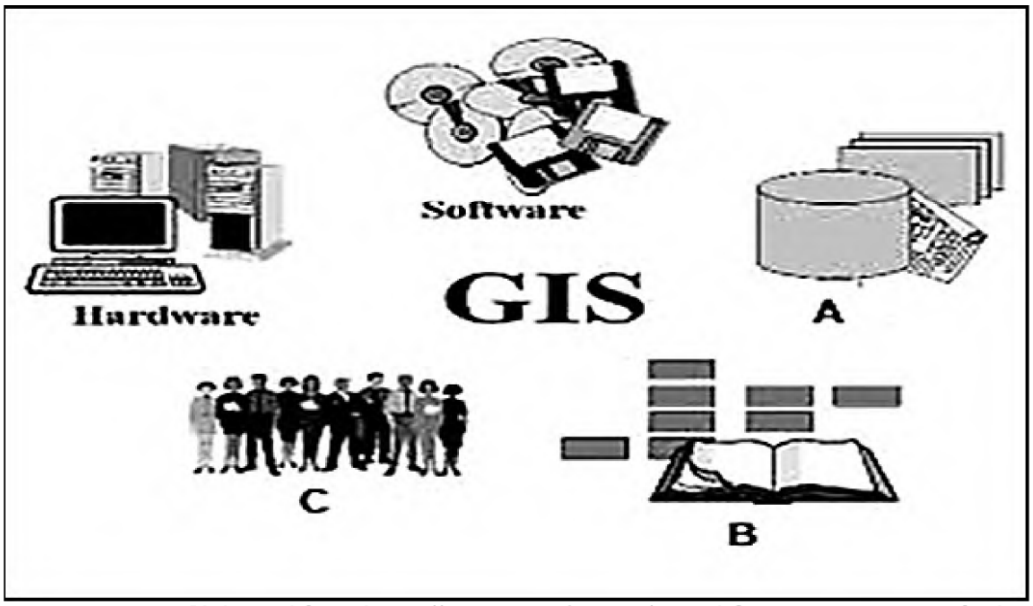
3.3 GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

Various options are provided as a possible answer to QUESTION 3.3.1. Choose the answer and write only the letter (A–D) next to the question number (3.1.1) in the ANSWER BOOK.

3.3.1 The vector feature at **O** in block **H7/8** is a …

A node.
B polygon.
C point.
D line. (1 x 1) (1)

3.3.2 Refer to the sketch below illustrating GIS processes and tools.



[Adapted from https://www.google.com/search? q=components+of+gis +in+geography&rlz]

(a) What is represented in the sketch? (1 x 1) (1)

(b) Name **A** and **B**. (2 x 1) (2)

(c) Why is **C** important in the GIS process? (2 x 2) (4)
[30]

TOTAL: 150

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GEOGRAPHY P1

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MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 11 pages.

SECTION A: PHYSICAL GEOGRAPHY

QUESTION 1: CLIMATOLOGY

1.1	1.1.1	G (1)		
	1.1.2	D (1)		
	1.1.3	A (1)		
	1.1.4	F (1)		
	1.1.5	D/B (1)		
	1.1.6	E (1)		
	1.1.7	C (1)	(7 x 1)	(7)
1.2	1.2.1	G (1)		
	1.2.2	I (1)		
	1.2.3	F (1)		
	1.2.4	E (1)		
	1.2.5	D (1)		
	1.2.6	C (1)		
	1.2.7	A (1)		
	1.2.8	B (1)	(8 x 1)	(8)

1.3 1.3.1 Isobars are lines on a weather map joining places of equal atmospheric pressure (2)
[**CONCEPT**] (1 x 2) (2)

1.3.2 4 hPa/mb (1) (1 x 1) (1)

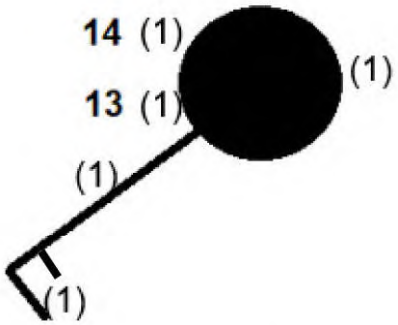
1.3.3 Highest values are in the centre (1) (1 x 1) (1)

1.3.4 Winter (1) (1 x 1) (1)

1.3.5 Date is 01/06/2012 (1)
Cold front influencing the weather of Cape Town (1)
High pressure systems migrated northwards (1)
[**ANY TWO**] (2 x 1) (2)

1.3.6 (a) Cold front (1) (1 x 1) (1)

(b)



(5 x 1) (5)

1.3.7 Isobars are nearer in area **C**/Isobars are further apart in area **B** (2)
Pressure gradient is steeper in area C/Pressure gradient is weaker in area B (2)
[**ANY ONE**] (1 x 2) (2)

1.4	1.4.1	Greenhouse gases are gases in Earth's atmosphere that trap heat and causes the annual temperature to increase (2)	(1 x 2)	(2)
	1.4.2	Greenhouse gases allow sunlight to pass into the atmosphere but blocks Earth's heat from escaping into space (2)	(1 x 2)	(2)
	1.4.3	Trees remove CO_2 from the atmosphere during photosynthesis (2) Deforestation increase the amount of CO_2 in the atmosphere (2) When trees are cut down their stored CO_2 is released into the atmosphere (2) CO_2 is a greenhouse gas that absorbs Earth's heat and prevents it from escaping into space causing higher temperatures (2) [**ANY TWO**]	(2 x 2)	(4)
	1.4.4	More frequent and severe weather (Accept examples) (2) More deaths due to increase of heat (e.g. heat strokes increase)/Elderly and weak become more vulnerable to death (2) Increased air pollution (2) Higher wildlife extinction rates (2) More acidic oceans (2) Higher sea levels (2) [**ANY TWO**]	(2 x 2)	(4)
	1.4.5	Reuse, recycle and reduce (2) Use less heat and air conditioning (2) Replace your light bulbs (2) Drive less (2) Drive smart (e.g. carpooling) (2) Buy energy-efficient products (2) Use less hot water (2) Plant trees (2) [**ANY TWO**]	(2 x 2)	(4)

1.5	1.5.1	A – Orographic/Relief rainfall (1) B – Cyclonic/Frontal rainfall (1)	(2 x 1)	(2)
	1.5.2	A – Mountain (1) B – Frontal conditions (1)	(2 x 1)	(2)
	1.5.3	Soft, continuous rain over a wide area (2)	(1 x 2)	(2)
	1.5.4	Orographic/relief rainfall occurs when warm, moist air blows off the ocean onto the mountain (2) This warm, moist air is then forced to rise by the mountain (2) As the warm air rises, it cools, and condensate (2) When the cloud is fully formed with condensation level reached, the rain then falls on the side of the mountain that faces the ocean (2) The leeward side of the mountain is then left with dried air that blows down the mountain range (2) The warm dry air that descended the leeward side continues to pull moisture out the land (2) **[ANY FOUR]**	(4 x 2)	(8)
				[60]

QUESTION 2 – GEOMORHOLOGY

2.1	2.1.1	C (1)		
	2.1.2	B (1)		
	2.1.3	C (1)		
	2.1.4	A (1)		
	2.1.5	B (1)		
	2.1.6	C (1)		
	2.1.7	A (1)	(7 x 1)	(7)
2.2	2.2.1	Sedimentary (1)		
	2.2.2	Metamorphic (1)		
	2.2.3	Sedimentary (1)		
	2.2.4	Igneous (1)		
	2.2.5	Sedimentary (1)		
	2.2.6	Igneous (1)		
	2.2.7	Metamorphic (1)		
	2.2.8	Igneous (1)	(8 x 1)	(8)

2.3 2.3.1 The theory that explains how continents shift positions on the Earth's surface (1)
[**CONCEPT**] (1 x 2) (2)

2.3.2 South America (1)
Africa (1)
Antarctica (1)
Australasia (1)
[NOT INDIA AND AUSTRALIA]
[**ANY TWO**] (2 x 1) (2)

2.3.3 Rotation of the Earth around its own axis (1) (1 x 1) (1)

2.3.4 Two tectonic plates move away from each other (2)
Molten rock from the mantle solidify to create a new oceanic crust (2)
[ANY ONE] (1 x 2) (2)

2.3.5 The east coast of South America and the west coast of Africa match well. (2)
Rock formations match up across the coastlines of South America and South Africa (2)
Identical deposits have been found in South America and Africa (2)
The discovery of fossils in both Africa and South America suggested that these two continents had once been joined (2)
[**ANY TWO**] (2 x 2) (4)

2.3.6 Continental drift states that the world was made up of a single continent (2)
The theory of plate-tectonics, states that earth's surface is broken into numbers of shifting plates (2) (2 x 2) (4)

2.4	2.4.1	(a)	Seismograph (1)	(1 x 1)	(1)
		(b)	Tectonic plates are moving daily (2) Plate boundaries is converging and diverging daily (2) [**ANY ONE**]	(1 x 2)	(2)
	2.4.2		The focus is the place under the surface where the earthquake originated (1) The epicentre is the area directly above the focus on the Earth's surface where the earthquake is at its severest (1) **[CONCEPT]**	(2 x 1)	(2)
	2.4.3	(a)	All earthquakes with a magnitude of more than 7 on the Richter scale is big (2)	(1 x 2)	(2)
		(b)	The movement of tectonic plates from east to west to east (2)	(1 x 2)	(2)
		(c)	Where one tectonic plate slides under another plate (2)	(1 x 2)	(2)
		(d)	The underthrusting jams up or binds the Earth (2) The jam is finally torn/broken resulting in an earthquake (2)	(2 x 2)	(4)

2.5	2.5.1	Eruptions are evident (1)	(1 x 1)	(1)
	2.5.2	Symmetrical shape (1) Very steep sides (1) Alternative layers of lava flow, ash, and cinders (1) [**ANY TWO**]	(2 x 1)	(2)
	2.5.3	A – Side vent (1) B – Crater (1)	(2 x 1)	(2)
	2.5.4	C – Lava (1) D – Magma (1)	(2 x 1)	(2)
	2.5.5	**Advantages:** Materials produce fertile soils (2) Ash and cinder are natural fertilizers as they are rich in minerals (2) As lava cools and is eroded by the elements it also adds to soil fertility (2) Create beautiful landscapes that promote tourism (2) Mineral deposits (2) Promotes the generation of geo-thermal energy (2) **Disadvantages:** It performs a lot of infrastructure destruction (2) The volcanic eruptions also produce harmful gases that destroy crops and slow businesses (2) The lava heat act as a booster for the global warming, which can cause either droughts or floods (2) The lava flow often destroys crops and livestock (2) The lava flow often causes wild fire in the nearby forestlands and negatively influence tourism (2) [**ANY FOUR**]	(4 x 2)	(8)
				[60]

SECTION B: GEOGRAPHICAL SKILLS AND TECHNIQUES

QUESTION 3

3.1 MAP SKILLS AND CALCULATIONS

3.1.1 C/Landing strip (1) (1 x 1) (1)

3.1.2 B/3224 AD (1) (1 x 1) (1)

3.1.3 (a) Aberdeen (1) (1 x 1) (1)

(b) Uphill (1)

Reason:
The bench marks increase in a south-westerly direction (2)
(1 + 2) (3)

3.1.4 (a) Formula: **Map distance x scale**

5 cm (1) x 100(1) = 500 m (1) [measurement range = 4,9 cm–5,1 cm]

OR

$$\frac{9{,}1\ \text{cm}(1) x\ 10\ 000(1)}{100\ 000}$$

= 0,91 km x 1 000
= 910 m (1)
Range [900 m–920 m] (3 x 1) (3)

(b) Scales of the maps differ (1)
Scale of the topographical map is 1 : 50 000 and the scale of the orthophoto map is 1 : 10 000 (1)
The scale of the topographical map is smaller than the scale of the orthophoto map (1)
The scale of the orthophoto map is bigger than the scale of the topographical map (1)
[**ANY ONE**] (1 x 1) (1)

3.2 MAP INTERPRETATION

3.2.1 D/recreational (1) (1 x 1) (1)

3.2.2 B/spur (1) (1 x 1) (1)

3.2.3 (a) L (1) (1 x 1) (1)

(b) L is at a higher altitude than K (1)
The higher you go, the cooler it becomes (1)
Temperature decreases with height (1)
[**ANY ONE**] (1 x 1) (1)

3.2.4 Non-perennial rivers (1)
Canals (1)
Furrows (1)
Windpumps (1)
Reservoirs (1)
[**ANY TWO**] (2 x 1) (2)

3.2.5 (a) M – Neck (1)
N – Butte (1) (2 x 1) (2)

(b) The crest of L is smaller than the crest of N (2)
The slopes towards the crest of L is steeper than the slopes towards the crest of N (2) (2 x 2) (2)

3.3 GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

3.3.1 B/Polygon (1) (1 x 1) (1)

3.3.2 (a) Components of GIS (1) (1 x 1) (1)

(b) A – Data (1)
B – Methods (1) (2 x 1) (2)

(c) People are responsible of the management of GIS systems (2)
People develop plans for application (2)
People design programs for users (2)
People use the GIS for decision-making (2)
People manipulate the data and information (2) (4)
[**ANY TWO**] (2 x 2)

[30]

TOTAL: 150