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education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT

GRADE 10

GEOGRAPHY

JUNE 2024

MARKS: 150

TIME: 3 hours

This question paper consists of 15 pages.

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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 on 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 must state, name, identify or list.
10. Units of measurement MUST be indicated in your final answer, e.g. 1 020 hope, 14°C and 45m.
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 3224BC GRAAFF REINET and a 1:10 000 orthophoto map 3224BC 01 GRAAFF REINET are provided.
15. The area demarcated in RED/BLACK on the topographical map represents the area covered by the orthophoto map.
16. Marks will be allocated for steps in calculations.
17. You must hand in the topographical map and orthophoto map to the invigilator at the end of this examination.

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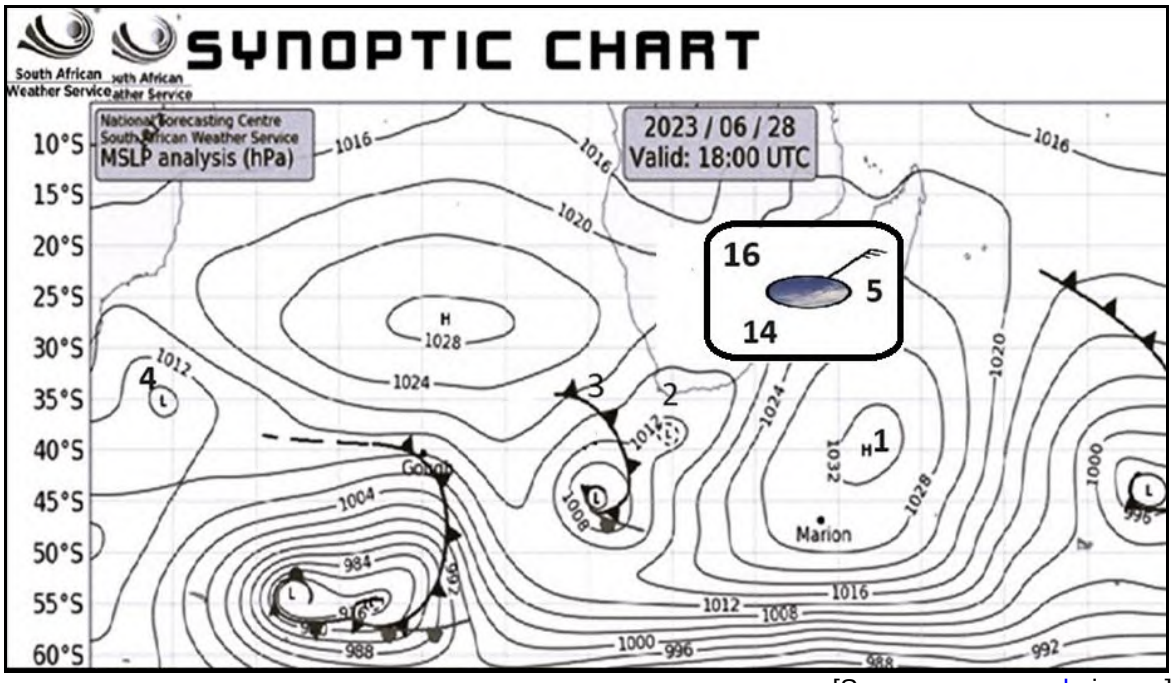
SECTION A: THE ATMOSPHERE AND GEOMORPHOLOGY

QUESTION 1: THE ATMOSPHERE

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



[Source: www.google image]

1.1.1 The pressure cell at **1** is a … pressure cell.

A hot
B high
C heavy
D hard

1.1.2 The area at **2** will experience … rainfall within the next 24 hours.

A continental
B orographic
C frontal
D relief

1.1.3 The front at **3** is called a the … front.

A warm
B occluded
C moisture
D cold

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1.1.4 The pressure cell at **4** is a … pressure cell.

A low
B wet
C high
D dry

1.1.5 … season illustrated by this synoptic weather map.

A Summer
B Spring
C Mild
D Winter

1.1.6 The cloud cover at **5** (the weather station) is … oktas.

A 8/8
B 4/8
C 2/8
D 6/8

1.1.7 The air temperature at **5** (the weather station) is … ºC.

A 10
B 16
C 14
D 12

1.1.8 The dew point temperature at **5** (the weather station) is … ºC.

A 10
B 16
C 14
D 12

(8 x 1) (8)

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1.2 Give ONE word/ term for each of the following descriptions, from the list below. Write only the word/ term of your choice next to the question number. E.g. 1.2.8 snow.

Run-off; Precipitation; Humidity; Relative humidity; Evaporation; Condensation; Dew point; Clouds

1.2.1 The amount of water vapour in the air.

1.2.2 The process whereby water changes in water vapour.

1.2.3 The process whereby water vapour changes to water.

1.2.4 Any form of water released from the atmosphere.

1.2.5 The temperature at which condensation of water vapour takes place.

1.2.6 Minute water droplets ice crystals floating in the atmosphere.

1.2.7 The amount of water vapour in the air compared to how much it could obtain.

(7 x 1) (7)

1.3 Refer to the cartoon below showing the effects of ozone depletion.

[Source: www.bonusjoules.co.za]

1.3.1 Explain the concept of *ozone depletion.* (1 x 2) (2)

1.3.2 Name the layer of the atmosphere in which you would find the ozone layer. (1 x 1) (1)

1.3.3 Identify TWO of the main human causes of the destruction of the ozone layer. (2 x 1) (2)

1.3.4 Using the cartoon as a guide, list TWO effects of ozone depletion. (2 x 1) (2)

1.3.5 In a paragraph of approximately EIGHT lines, explain ways on how to reduce ozone depletion. (4 x 2) (8)

[15]

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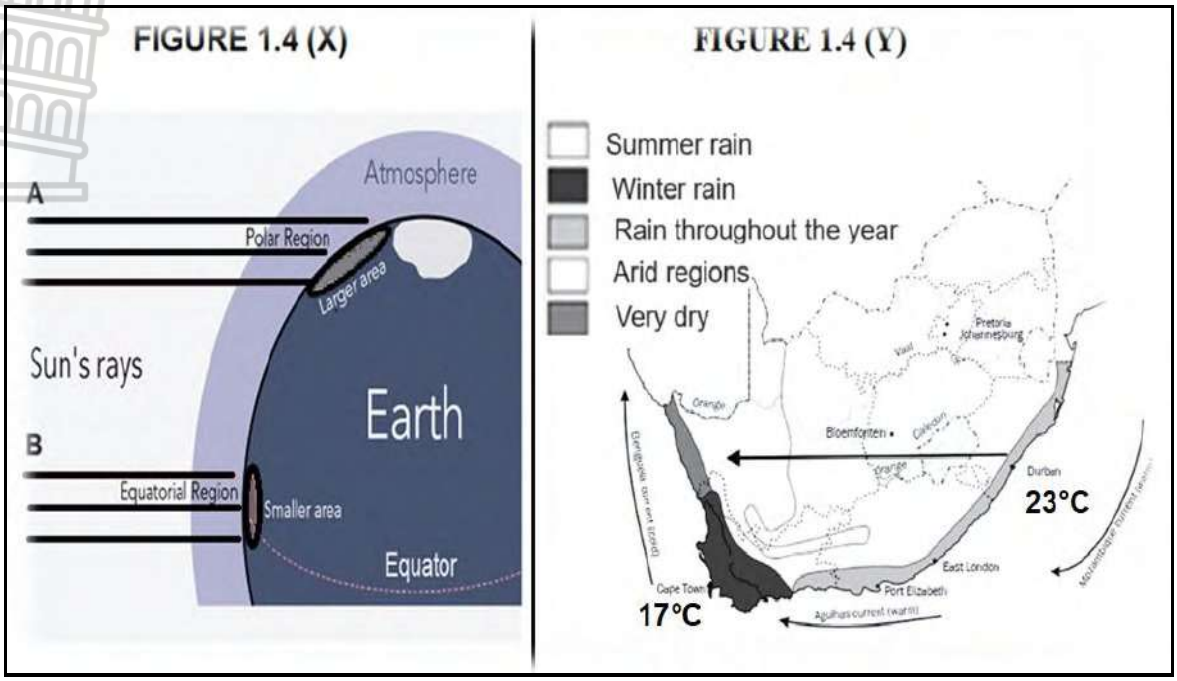
1.4 FIGURE 1.4 (X) shows the way in which the sun's ray reaches the earth's surface and FIGURE 1.4 (Y) shows the location of Cape Town and Durban.



[Source: Researchgate.net]

1.4.1 Which factor is affecting the temperature distribution in FIGURE 1.4 (**X**)? (1 x 1) (1)

1.4.2 Which factor is affecting the temperature distribution in FIGURE 1.4 (**Y**)? (1 x 1) (1)

1.4.3 Name ONE factor affecting temperature that is not shown in FIGURE 1.4 (**X**) and (**Y**). (1 x 1) (1)

1.4.4 Explain why the temperature on FIGURE 1.4 (**X**) is likely to be higher in area **(b)** than area **(a)**. (2 x 2) (4)

1.4.5 Suggest why the North West province is experiencing continental climate. (2 x 2) (4)

1.4.6 Cape Town is situated on the western coast and Durban on the eastern coast of South Africa, but experience different weather conditions. Explain why Durban experiencing high temperatures and more rainfall compared to Cape Town. (2 x 2) (4)

[15]

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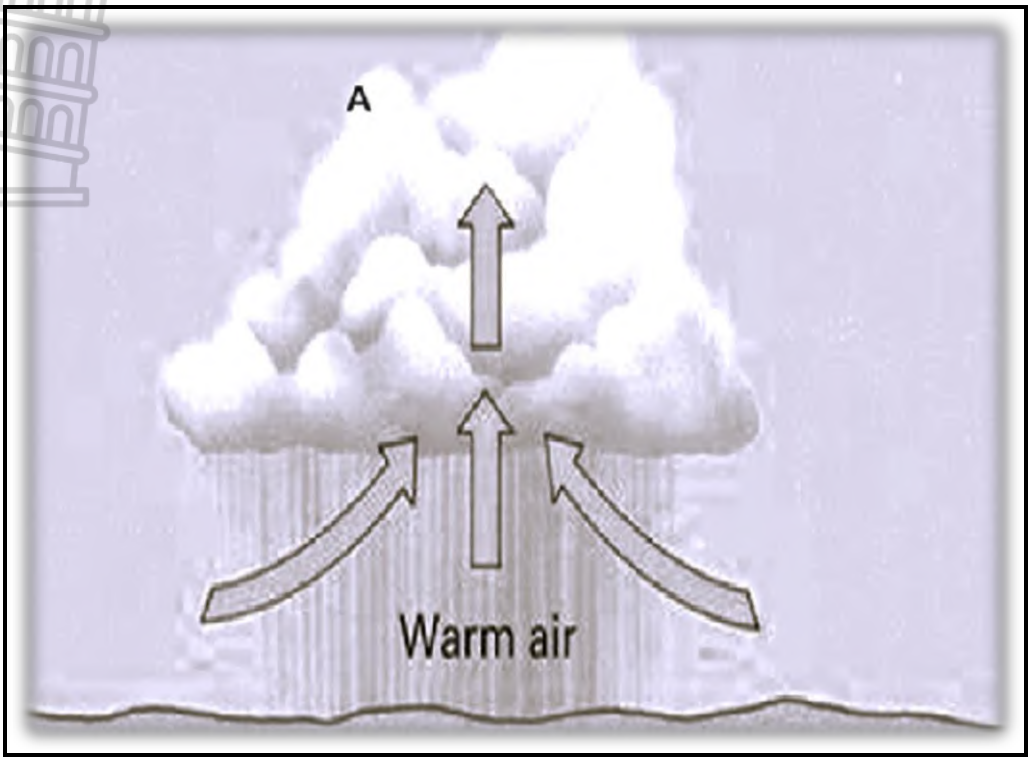
1.5 Refer to the FIGURE below showing convectional rainfall.



[source:www.slideserve.com]

1.5.1 During which season (summer/winter) is convectional rain more common? (1 x 1) (1)

1.5.2 Conventional rainfall is more common in the (North West/ Western Cape) province of South Africa. (1 x 1) (1)

1.5.3 (a) Name the type of cloud labelled **A**. (1 x 1) (1)

(b) Mention TWO weather conditions associated with the type of clouds mentioned in QUESTION 1.5.3 (a). (2 x 1) (2)

1.5.4 Explain the formation of convectional rain. (2 x 2) (4)

1.5.5 Describe the negative impacts of thunderstorms on the environment. (3 x 2) (6)

[15]
(60)

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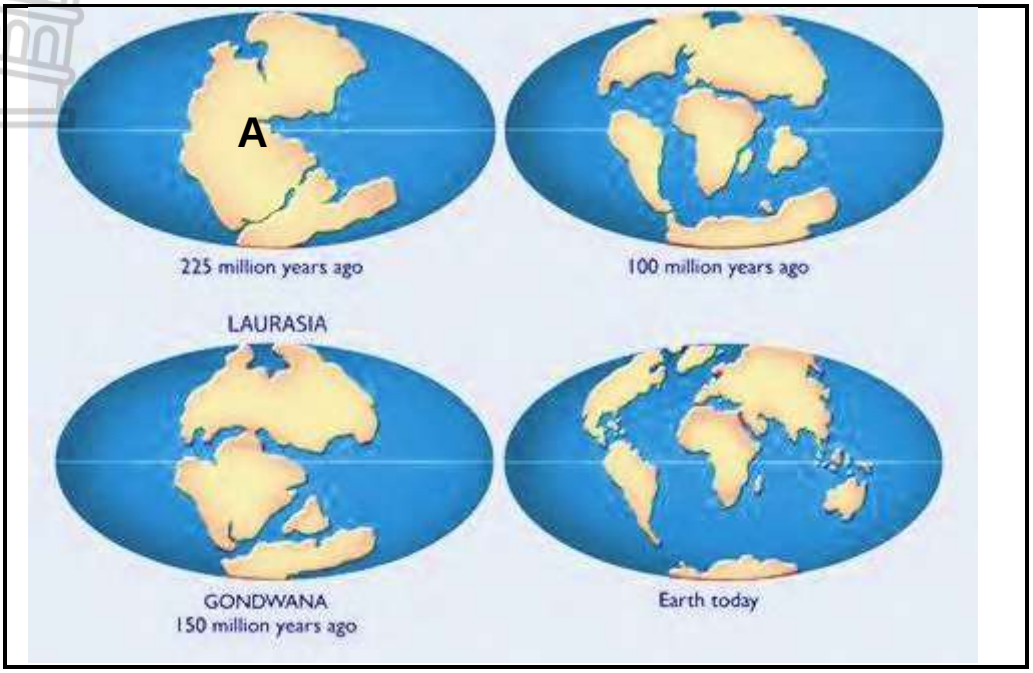
QUESTION 2: GEOMORPHOLOGY

2.1 Refer to the sketches on continental drift theory and choose the term/ word in the brackets to make the statements TRUE. E.g. 2.1.8 batholith.



[Source: www.istockphoto]

2.1.1 The theory of continental drift is most associated with scientist (Alfred Wegener/ Alfred Einstein).

2.1.2 The supercontinent at **A** was called (Gondwanaland/ Pangaea).

2.1.3 150 million years ago North America was part of the continent called (Laurasia/ Gondwanaland).

2.1.4 150 million years ago India was part of the continent called (Laurasia/ Gondwanaland).

2.1.5 Evidence for continental drift was that the (same/ different) types of fossilised plants and animals are found in South America and Africa.

2.1.6 Continents rest on massive slabs of rock called (mountains/ tectonic plates).

2.1.7 Movement of continent are (no longer/ still) taking place today.

(7 x 1) (7)

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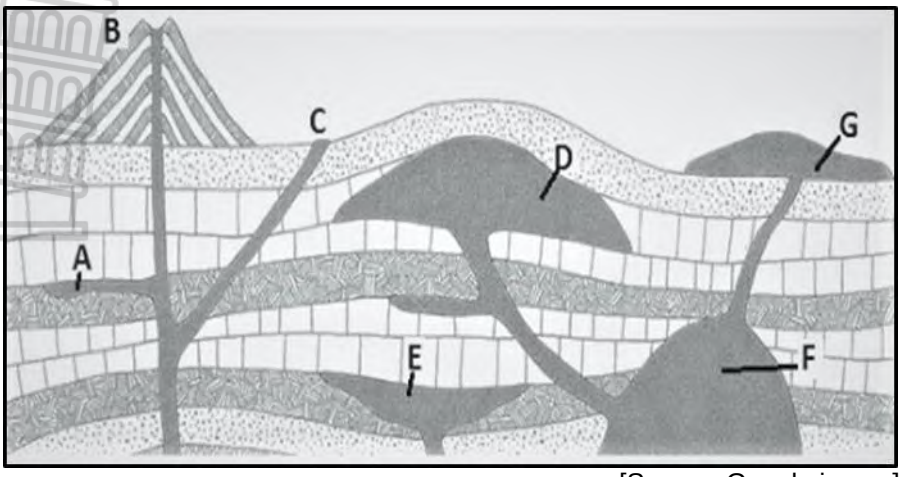
2.2 Refer to the FIGURE below which shows the various igneous intrusions.



[Source: Google image]

2.2.1 Which letter indicates the batholith igneous intrusion? (1)

2.2.2 Which letter indicates a laccolith igneous intrusion? (1)

2.2.3 Label the igneous intrusions indicated by the letters **A**, **B** and **C** either as sill, volcano, and dyke. (3)

2.2.4 Igneous intrusions forms when (magma/ lava) solidifies underneath the earth's surface. (1)

2.2.5 Which letter indicates a granite dome. (1)

2.2.6 (Weathering of rocks/Erosion of top soil) is the process that is responsible for the exposure of intrusive igneous features on the Earth surface. (1)

(8 x 1) (8)

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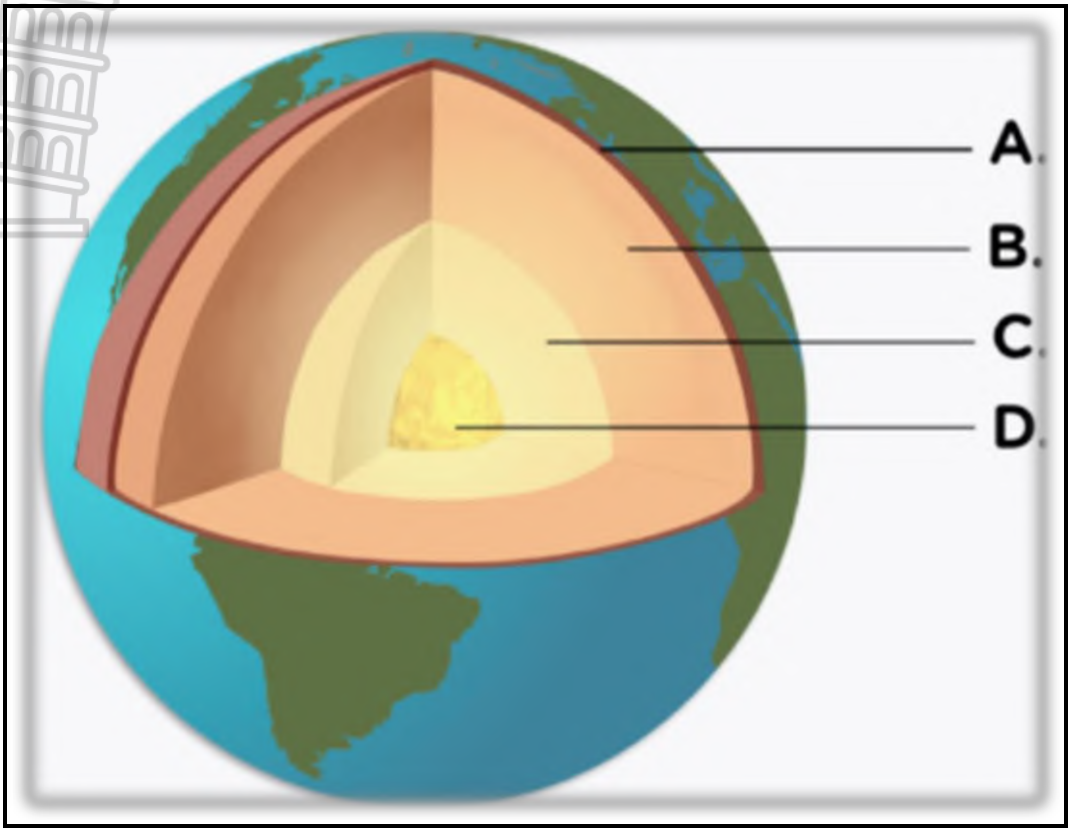
2.3 Refer to the FIGURE below showing the internal structure of the earth.



[Source: www.quizlet.com]

2.3.1 Identify the layers **A** and **B**. (2 x 1) (2)

2.3.2 List ONE main type of rock that forms within layer **A** or below the earth surface. (1 x 1) (1)

2.3.3 Describe TWO uses of any type of rock listed in QUESTION 2.3.2 (2 x 2) (4)

2.3.4 Differentiate between *Sial* and *Sima.* (2 x 2) (4)

2.3.5 Describe the characteristics of layer labelled A. (2 x 2) (4)
[15]

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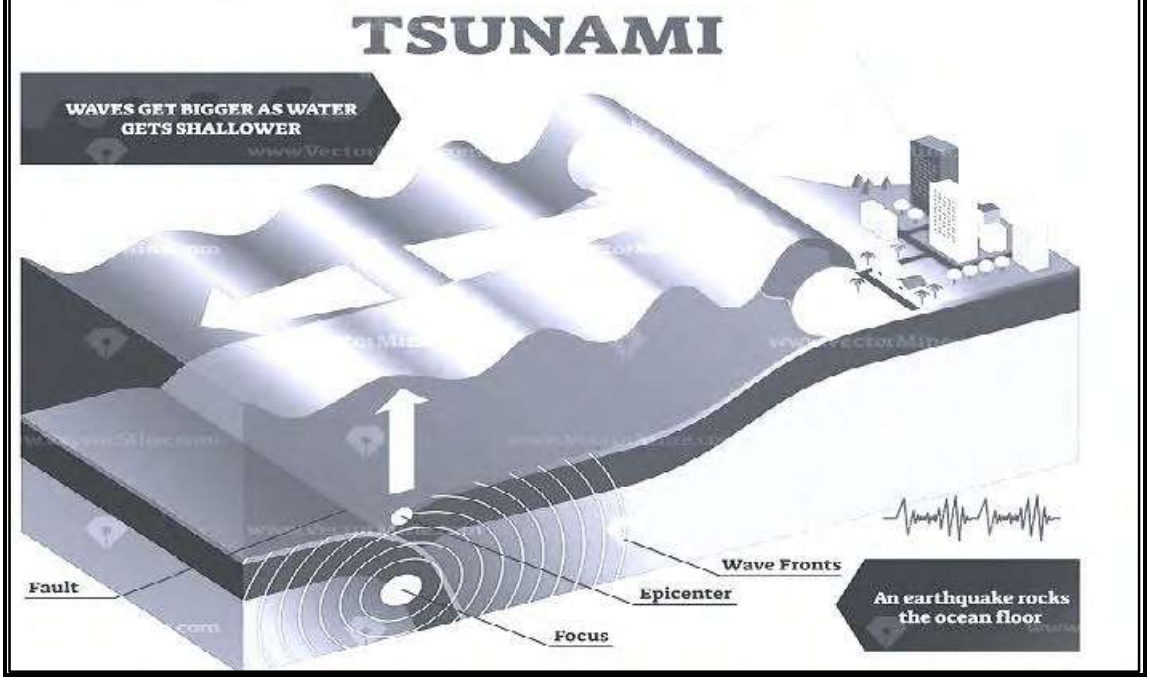
2.4 Study the information below about tsunamis and earthquakes.

On December 26, 2004, an undersea earthquake with a magnitude of 9.1 struck off the coast of the Indonesian island of Sumatra. The earthquake triggered a tsunami that reached across the Indian Ocean, devastating coastal areas as far away as East Africa. The tsunami had waves up to 30 m (100 ft) high and killed an estimated 227,898 people in 14 countries, making it one of the deadliest natural disasters in recorded history.



[Source: Google images]

2.4.1 What trigged the tsunami on the 26 December 2004? (1 x 1) (1)

2.4.2 Differentiate between the *focus* and *epicentre* of an earthquake. (2 x 2) (4)

2.4.3 Explain how a tsunami originates. (2 x 2) (4)

2.4.4 Suggest THREE methods that can be used in to reduce the impact of a tsunami. (3 x 2) (6)

[15]

2.5 Carefully read the case study below about a volcanic eruption in Indonesia's Mount Merapi volcano.

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Indonesia's Mount Merapi volcano erupts, spewing hot clouds into the air.

Merapi is the most active of more than 120 active volcanoes in Indonesia and has repeatedly erupted with lava and gas clouds in recent years. Its last major eruption, in 2010, killed 347 people and displaced 20,000 villagers.

The eruption sent ash as high as 3,000 metres into the air, and volcanic ash was deposited in several nearby districts.

Indonesia, with a population of 270 million people, is prone to earthquakes and volcanic activity because it sits along the Ring of Fire, a horseshoe-shaped series of seismic fault lines around the Pacific Ocean.

[Adapted from: Indonesia's Mount Merapi volcano erupts, spewing hot clouds into the air - ABC News]

2.5.1 Define the term *volcanism*. (1 x 2) (2)

. 2.5.2 How many people were killed during the 2010 eruption? (1 x 1) (1)

2.5.3 Complete the sentence below by choosing the correct word in brackets: Mount Merapi is among more than 120 (dormant/ active) volcanoes in Indonesia, prone to seismic upheaval due to its location on the Pacific (Ring of Fire/ Ring of Ash). (2 x 1) (2)

2.5.4 "Volcanic ash is a threat to people". Explain why? (1 x 2) (2)

2.5.5 In approximately EIGHT lines, explain the positive and negative effects that are associated with volcanoes. (4 x 2) (8)

[15]
(60)

TOTAL SCTION A: 120

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SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

GENERAL INFORMATION ON GRAAFF-REINET

Graaff-Reinet is a small town in the Eastern Cape with a population of around 36 000. This town is in the Sarah Baartman District and is one of the oldest towns in South Africa after Cape Town, Stellenbosch and Swellendam. Nature conservation is a priority in this area, the Camdeboo National Park almost surrounds Graaff-Reinet. It provides the visitor with insights into the unique landscape and ecosystem of the Karoo. Space, nature, and heritage combine to offer a Karoo tourism experience.

Coordinates: 32°15′08″S 24°32′26″E / 32°15,1′S 24°32,4′E

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3.1 MAP SKILLS AND CALCULATIONS

3.1 Refer to the 1: 50 000 topographic map 3224BC GRAAFF-REINET and a 1: 10 000 orthophoto map of 3224BC 01 GRAAF-REINET to answer the following questions in the ANSWER BOOK.

3.1.1 The map code of the topographic map of Graaf-Reinet indicates that the town lies on the …

A 32 º E longitude and 24 º N latitude.
B 32 º W longitude and 24 º E latitude.
C 32 º S latitude and 24 º E longitude.
D 32 º E latitude and 24 º W longitude. (1 x 1) (1)

3.1.2 The contour interval of the orthophoto map is …

A 20 m.
B 15 m.
C 10 m
D 5 m. (1 x 1) (1)

3.1.3 The scale of the orthophoto map is … than the scale of the topographic map.

A 5 times larger
B 5 times smaller
C 10 times larger
D 10 times smaller (1 x 1) (1)

3.1.4 Determine the true bearing as well as the direction of spot height 792 **(G3)** from spot height 805 **(F1)** on the topographical map. (2 x 1) (2)

3.1.5 Use the information on the topographical map to determine the magnetic declination for 2024. Show all calculations. Marks will be awarded for calculations.

Use of the following steps to answer this question:
(a) Difference in years.
(b) Mean annual change.
(c) Total change.
(d) Magnetic declination for 2024. (5 x 1) (5)

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3.2 MAP INTERPRETATION

3.2.1 What is the altitude of the following features?

3.2.1.a) National Road in block **F4**.

3.2.1.b) Spot height in block **D10**.

3.2.1.c) Trigonometrical station 90 in block **E3**. (3 x 1) (3)

3.2.2 Identify the ONE recreational activity practice in **F6**. (1 x 1) (1)

3.2.3 Is the slope of the land from trigonometrical station 90 **(E3)** to spot height 805 **(F1)** convex or concave? (1 x 1) (1)

3.2.4 Suggest a reason for your answer in QUESTION 3.2.3. (1 x 2) (2)

3.2.5 Graaf-Reinet is experiencing seasonal rainfall. Give TWO pieces of evidence to support this statement. (2 x 1) (2)

3.2.6 Is Spandaukop in block **E3** a protected area? (1 x 1) (1)

3.2.7 Support your answer to QUESTION 3.2.6. (1 x 2) (2)

3.3 GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

3.3.1 Define the term *remote sensing.* (1 x 2) (2)

3.3.2 Which component of GIS is the orthophoto map? (1 x 1) (1)

3.3.3 Name ONE example of computer hardware component. (1 x 1) (1)

3.3.4 Explain briefly why the topographical map can be classified as vector data. (1 x 2) (2)

3.3.5 Refer to blocks **B7** and **B8** on the topographic map. Identify ONE *point* feature and ONE *polygon* feature in the area? (2 x 1) (2)

TOTAL SECTION B: 30

GRAND TOTAL: 150

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PROVINCIAL ASSESSMENT

GRADE 10

GEOGRAPHY

JUNE 2024

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 8 pages.

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SECTION A
QUESTION 1

1.1.

1.1.1 B (1)
1.1.2 C (1)
1.1.3 D (1)
1.1.4 A (1)
1.1.5 D (1)
1.1.6 A (1)
1.1.7 B (1)
1.1.8 C (1) (8 x 1) (8)

1.2.

1.2.1 Humidity (1)
1.2.2 Evaporation (1)
1.2.3 Condensation (1)
1.2.4 Precipitation (1)
1.2.5 Dew point (1)
1.2.6 Clouds (1)
1.2.7 Relative humidity (1) (7 x 1) (7)

1.3

1.3.1 Ozone depletion is the destruction of ozone so that a hole form in the ozone layer. (Concept) (2) (1 x 2) (2)

1.3.2 Stratosphere (1) (1 x 1) (1)

1.3.3 Overgrazing (1)
Deforestation (1)
CFC's (1)
(ANY TWO) (2 x 1) (2)

1.3.4 It may cause skin cancer (1)
Eye cataracts (1)
Lowering of immune system, resulting in increased illness in people & animals (1)
Increase in the incidence of malaria (1)
(ANY TWO) (2 x 1) (2)

1.3.5 People should try to use products labelled "ozone friendly" (2)
The Montreal Protocol is seen as one of the most successful attempts at reducing the effects of ozone depletion (2)
All CFCs should be replaced (2)
Plant more trees (2)
Use public transport (2)
Educational awareness programmes (2)
(ANY FOUR) (4 x 2) (8)

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1.4

1.4.1 Longitudinal position (1) (1 x 1) (1)

1.4.2 Role of ocean current (1) (1 x 1) (1)

1.4.3 Distance from the sea (1)
Aspect (1)
Altitude (1)
(ANY ONE) (1 x 1) (1)

1.4.4 Air is more heated at (b) because the sun's rays strike directly there. Heat is concentrated on a small surface area (2)
Solar energy travels through smaller volume of atmosphere therefore less scattering, absorption and scattering (2) (2 x 2) (4)

1.4.5 Far from the moderating effect of the oceans (2)
Climate characterised by hot summers and cold winters. (2) (2 x 2) (4)

1.4.5 The temperature of these two ocean currents that flows past these two towns are different, on the east coast the Warm Mozambique current flows past Durban and cold Benguela current on the west coast (2)
Rainfall depends on the amount of moisture in the atmosphere so air on the eastern side is moist and high probability of rainfall than the western side (2)
Air on the West coast is cold and dry, so chances of rainfall are low (2)
(3 x 2) (6)

1.5

1.5.1 Summer (1) (1 x 1) (1)

1.5.2 North West (1) (1 x 1) (1)

1.5.3 (a) Cumulonimbus cloud (1) (1 x 1) (1)

1.5.3 (b) Heavy rainfall (1)
Hailstorms (1)
Lighting (1)
Thunderstorms (1)
Cloudy conditions (1)
(ANY TWO) (2 x 1) (2)

1.5.4 Rainfall leads to faster growing plant/ grazing (2)
There will be enough water for livestock (2)
(ANY ONE) (1 x 2) (2)

1.5.5. Heavy rainfall may cause floods (2)
Floods cause erosion of soil erosion (2)
Heavy rainfall destroys natural vegetation (2)
Heavy rainfall destroys natural habitats of animal/ ecosystems (2)

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Hurt animal (2)
Lighting can burn vegetation (2)
(Any THREE) (3 X 2) (6)

QUESTION 2

2.1

2.1.1 Alfred Wegener (1)
2.1.2 Pangaea (1)
2.1.3 Laurasia (1)
2.1.4 Gondwanaland (1)
2.1.5 same (1)
2.1.6 tectonic plates (1)
2.1.7 still (1) (7 x 1) (7)

2.2

2.2.1 F (1)
2.2.2 D (1)
2.2.3 A- Sill (1)
B- Volcano (1)
C- Dyke (1)
2.2.4 magma (1)
2.2.5 G (1)
2.2.6 Erosion of top soil (1) (8 x 1) (8)

2.3

2.3.1 A – Crust (1)
B – Mantle (1) (2 x 1) (2)

2.3.2 Igneous rocks (1)
Sedimentary rocks (1)
Metamorphic rocks (1)
(ANY ONE) (1 x 1) (1)

2.3.3 **Uses of igneous rocks**
Contains valuable metals such as copper, gold, iron and manganese (2)
Mining activities can take place to generate income (2)
Provides building materials (2)
Can be used to make tombstones (2)

Uses of Sedimentary rocks
Used to make cements (2)
Can be used for building materials (2)
Can be used to make tiles and bricks (2)
Can be used to make statues and sculptures (2)

Uses of metamorphic rocks
Used for roofs and garden paths (2)

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Used in road construction (2)
Minerals are found in this rock for beautification and sculptures (2)
(Any TWO) (2 x 2) (4)

2.3.4 Sial is the upper layer of the earth (continental crust), made up of silica and aluminium (2)
Sima is the lower layer of the earth (oceanic crust), made up of silica and magnesium (2) (2 x 2) (4)

2.3.5 **Crust**
It is the solid outermost portion of the earth and is typically 8 to 40 kilometres thick. (2)
Its nature is brittle. (2)
The crust makes up about 5% of the earth's mass and almost 1% of its volume. (2)
Oceanic and continental regions have different crustal thicknesses. (2)
The oceanic crust is 5 km thinner. (2)
The thickness of continental crust about 30 kms. (2)
Crust composes of Silica (Si) and aluminium (Al). (2)
The crust's components have an average density of 3 g/cm^3. (2)
(ANY TWO) (2 x 2) (4)

2.4

2.4.1 Undersea earthquake (1) (1 x 1) (1)

2.4.2 **Focus**: Place inside the earth's crust where the earthquake originates (Concept) (2)
Epicentre: The point on the earth's surface directly above the focus (Concept) (2) (2 x 2) (4)

2.4.3 Result of an earthquake below or near the ocean floor that cause the ocean floor to suddenly rise or fall. (2)
A wave forms that radiate outward in all directions away from the source. (2)
(2 x 2) (4)

2.4.4 Provide them with shelter/food/ clean water (2)
Medical personal must be sent to affected areas (2)
Emergency personal must be sent to affected areas. (2)
Give affected people money to start their lives again (2)
Build houses on higher ground (2)
Build specially strengthened buildings (2)
Educate people (2)
Having disaster supplies on hand (2)
Early warning systems must be in place (2)
(ANY THREE) (3 x 2) (6)

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2.5

2.5.1 Volcanism is the eruption of molten rock from inside the earth to the surface. (Concept) (2) (1 x 2) (2)

2.5.2 347 people (1) (1 x 1) (1)

2.5.3 Active (1)
Ring of fire (1) (2 x 1) (2)

2.5.4 People can become ill because of breathing ash. (2) (1 x 2) (2)

2.5.5 **Negative effects of volcano**
Lava flows burn and bury vegetation and buildings (2)
Earth movements associated with a volcano can set off mudslides (2)
Harden lava can injure or kill people (2)

Positive effects of volcano
Volcanic ash can act as a fertiliser for soil (2)
Volcanic regions such as Hawaii become tourist attractions (2)
Underground water in volcanic regions is hot enough to use for heating systems and electricity generation (2)
(ANY FOUR) – (Must refer to both) (4 x 2) (8)
(60)

QUESTION 3

3.1

3.1.1 C (1) (1 X 1) (1)

3.1.2 D (1) (1 X 1) (1)

3.1.3 A (1) (1 X 1) (1)

3.1.4 128º (1)/ SE (1) (2 X 1) (2)

3.1.5 (a) Difference in years: 2024 – 2009 = 15 (1) years

(b) Mean annual change: 7' (1) Westwards

(c) Total change: 15 x 7' W = 105' W or 1º 45' (1) W

(d) magnetic declination for 2024:25 º 07' W +(1) 1º 45' = 26 º 52' West of True North (5 x 1) (5)
[10]

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3.2

3.2.1 a) 786,9 m (1)

3.2.1 b) 1088 m (1)

3.2.1 c) 1315,6 m (1) (3 x 1) (3)

3.2.2 Golf (1) (1 x 1) (1)

3.2.3 Concave (1) (1 x 1) (1)

3.2.4 Contours are close towards each other at the top and apart at the bottom of the slope (2) (1 x 2) (2)

3.2.5 Presence of non- perennial rivers (1) /
Reservoirs (1)/ Wind pumps (1)/ Dams (1) Furrows (1)
(ANY TWO) (2 x 1) (2)

3.2.6 Yes (1) (1 x 1) (1)

3.2.7 It is part of the Camdeboo National Park that is bounded by a green border (2)
Conservation is a priority in this area. (2)

(ANY ONE) (1 x 2) (2)
[12]

3.3

3.3.1 Remote sensing Collecting or gathering or capturing information about the earth from a distance without physical contact (Concept) (2) (1 x 2) (2)

3.3.2 Data (1) (1 x 1) (1)

3.3.3 mouse (1)
Printer (1)
hard drive (1)
keyboard (1)
monitor (1)
scanner (1)
digitiser (1)
cables (1)
CPU (1)
(ANY ONE) (1 x 1) (1)

Downloaded from Stanmorephysics.com

3.3.4 Topographical map consist of point, line and polygon symbols (2) (1 x 2) (2)

3.3.5 **Point:** School (1)

Church (1)

(ANY ONE) (1 x 1) (1)

POLYGON: Recreational areas (1)

built-up area (1)

(ANY ONE) (1 x 1) (1)

[8]

TOTAL SECTION B: 30

GRAND TOTAL: 150

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