GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

TYPE OF TASK: JUNE EXAMINATION

SUBJECT	:	GEOGRAPHY
GRADE	:	10
TERM	:	2
TIME	:	3 HOURS
TOTAL MARKS	:	150
DATE OF IMPLEMENTATION	:	6 JUNE 2023
TERM WEIGHTING	:	60%
SBA WEIGHTING	:	20%

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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)
   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 open between sub-sections of questions answered.

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., 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 **2629 DB ERMELO** and a 1 : 10 000 orthophoto map **2629DB 5 ERMELO**

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.

SECTION A: THE ATMOSHERE 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 number (1.1.1–1.1.7) in the ANSWER BOOK, e.g. 1.1.8 A.

1.1.1 This is an example of a constant gas.

A Nitrogen
B Carbon
C Hydrogen
D Vapour

1.1.2 These lines join places with equal air pressure.

A Isobars
B Isopleths
C Isotherms
D Contour Lines



1.1.3 These chemical compounds are responsible for the break-down of the ozone layer

A Greenhouse gases
B Chlorofluorocarbons
C Trace gases
D Methane

1.1.4 A transfer of heat through the contact of air molecules.

A Convection
B Radiation
C Conduction
D Insolation

1.1.5 An instrument used to measure rainfall.

A Thermometer
B Anemometer
C Rain gauge
D Hydrometer

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1.1.6 Inland climate which results in a big range between minimum and maximum temperatures.

A Maritime climate
B Continental climate
C Subtropical climate
D Humid climate

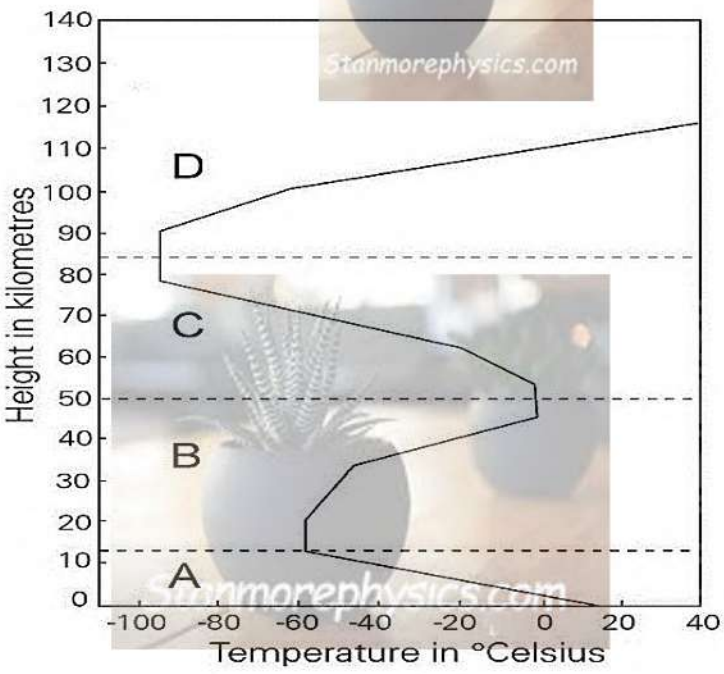
1.1.7 The following are greenhouse gases.

(i) Carbon-dioxide
(ii) Argon
(iii) Water vapour
(iv) Nitrogen

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

(7 x 1) (7)

1.2 Study the FIGURE showing layers of the atmosphere. Choose the correct letter (A – D) which matches the correct statements below



1.2.1 All weather activities take place in this layer.

1.2.2 The densest layer of the atmosphere.

1.2.3 Temperature inversion takes place in layer D and …

1.2.4 This layer is found above the tropopause.

1.2.5 This layer is found below the thermosphere.

1.2.6 Aeroplanes fly in this layer to avoid turbulence.

1.2.7 This layer has the highest amount of water vapour and oxygen.

1.2.8 Temperature decreases in height between A and …

(8x1) (8)

1.3 Refer to the article.

Climate change is happening, and it's mostly due to human activities that change the composition of the atmosphere, which in turn interferes with the natural flow of energy through the climate system.

Two greenhouse gases contribute most to this problem: carbon dioxide and methane. The result is global heating. The repercussions of rising temperatures include heavier rains, stronger storms, more intense droughts, heatwaves and wildfires.

Methane, which is more potent than carbon dioxide but has a shorter lifespan, reached record levels in the atmosphere last year, at about 2.5 times above those during the pre-industrial era.
Reducing methane emissions offers a way to rein in climate change quickly, at least to some extent, and to buy time while the world drastically reduces fossil fuel use.

The COP26 climate summit recognised this when more than 100 nations, representing 70% of the global economy, joined the Global Methane Pledge to cut methane emissions by 30% by 2030.

New Zealand joined, but Australia didn't. Nearly all of the pledges relate to cuts in "fugitive emissions" of methane through leaks in the oil and gas sector, especially from fracking operations during the drilling of new wells and from old, abandoned wells that have not been sealed properly.

Author: David McNew

[Source: https://theconversation.com/stemming-methane-leaks-from-oil-fields-pipelines-and-landfills-

1.3.1 Define the concept c*limate change.* (1 x 2) (2)

1.3.2 According to the article, what is the main contributor to climate change? (1 x 2) (2)

1.3.3 Name one gas from the article that causes climate change (1 x 1) (1)

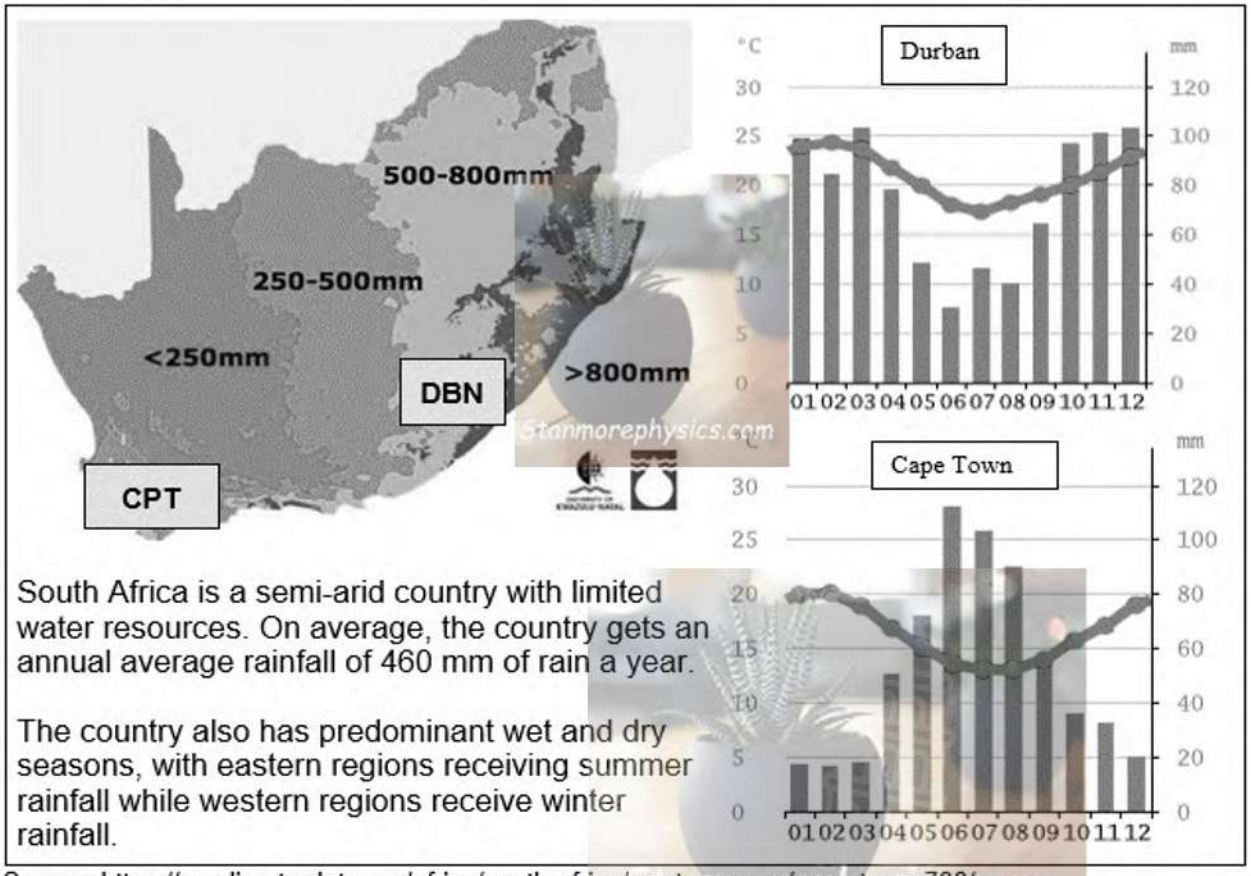
1.3.4 How did countries that attended the COP26 Summit show commitment to reduce methane emissions? (1 x 2) (2)

1.3.5 Suggest reasons why countries like Australia and other industrialised countries usually object (refuse) to signing pledges such as the one in the article. (2 x 2) (4)

1.3.6 Discuss strategies that local municipalities can implement to reduce the heating of the atmosphere and the resultant climate change. (2 x 2) (4)

[15]

1.4 Refer to the infographic on rainfall in South Africa.



Source: https://en.climate-data.org/africa/south-africa/western-cape/cape-town-788/

1.4.1 Name the type of climate experienced in Durban (1 x 1) (1)

1.4.2 Name the ocean currents that flow past Durban and Cape Town respectively. (2 x 1) (2)

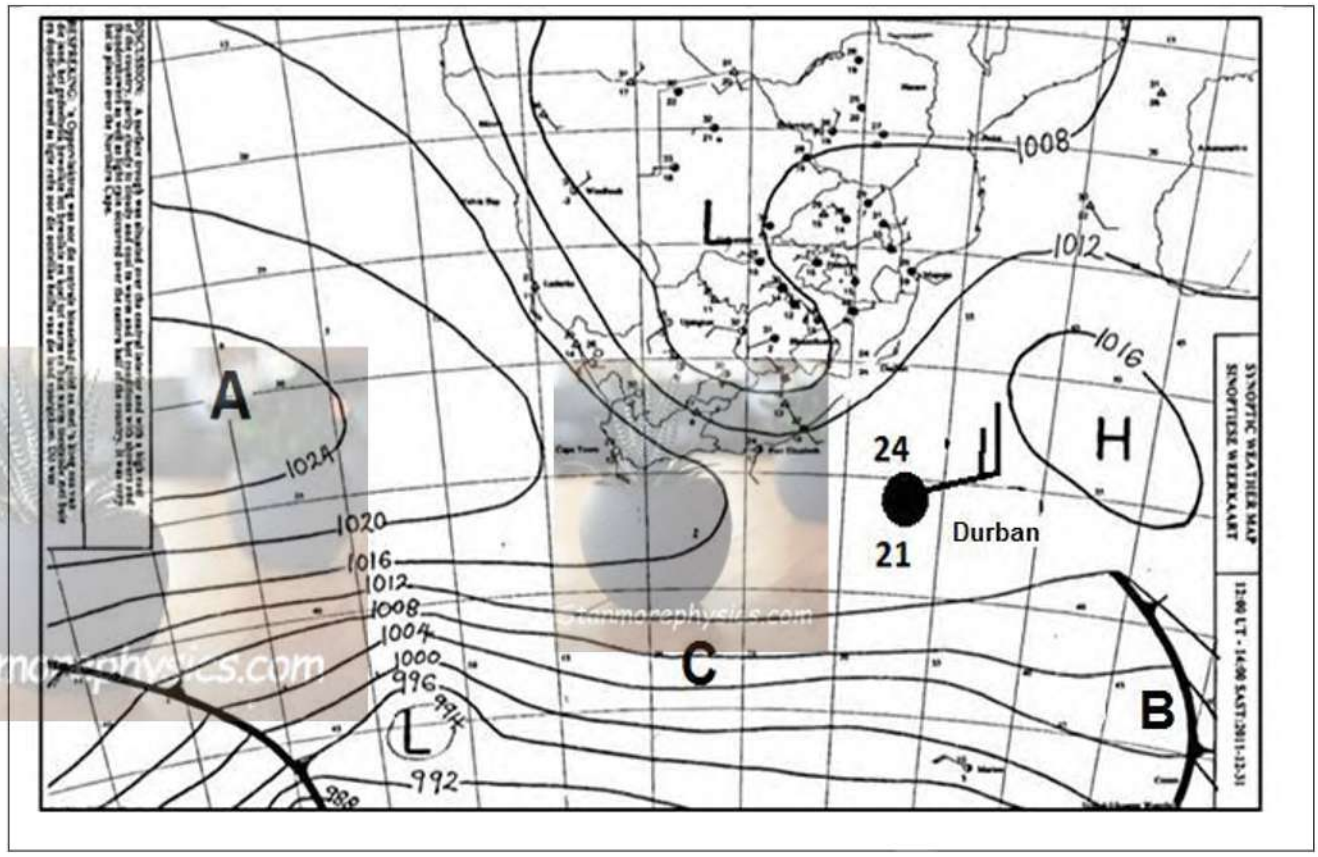
1.4.3 Describe the average rainfall variation from the east to the west of the country. (1 x 1) (1)

1.4.4 The rainfall graph above shows that rainfall in Cape town increases significantly in winter. With an aid of a well labelled diagram illustrate the type of rainfall experienced in Cape town during winter. (3 x 1) (3)

1.4.5 In a paragraph of approximately 8 lines discuss the economic and social impacts of the rainfall mentioned in QUESTION 1.4.4 (4 x 2) (8)

[15]

1.5 Refer to the synoptic weather map of South Africa.



1.5.1 What is a synoptic weather map? (1 x 2) (2)

1.5.2 Name the season represented by this synoptic weather map (1 x 1) (1)

1.5.3 Provide map evidence to support the answer to question 1.5.2. (1 x 1) (1)

1.5.4 Identify the high-pressure labelled **A** on the map. (1 x 1) (1)

1.5.5 Name the lines marked **C** on the map. (1 x 1) (1)

1.5.6 Describe the weather in Durban by referring to the following:

(a) Air temperature
(b) Dew point temperature
(c) Cloud cover

(d) Wind speed
(e) Wind direction (5 x 1) (5)

1.5.7 Refer to the enlarged station model of Durban and explain why there is high possibilities of rainfall occurring. (2 x 2) (4)

[15]

TOTAL QUESTION 1: 60

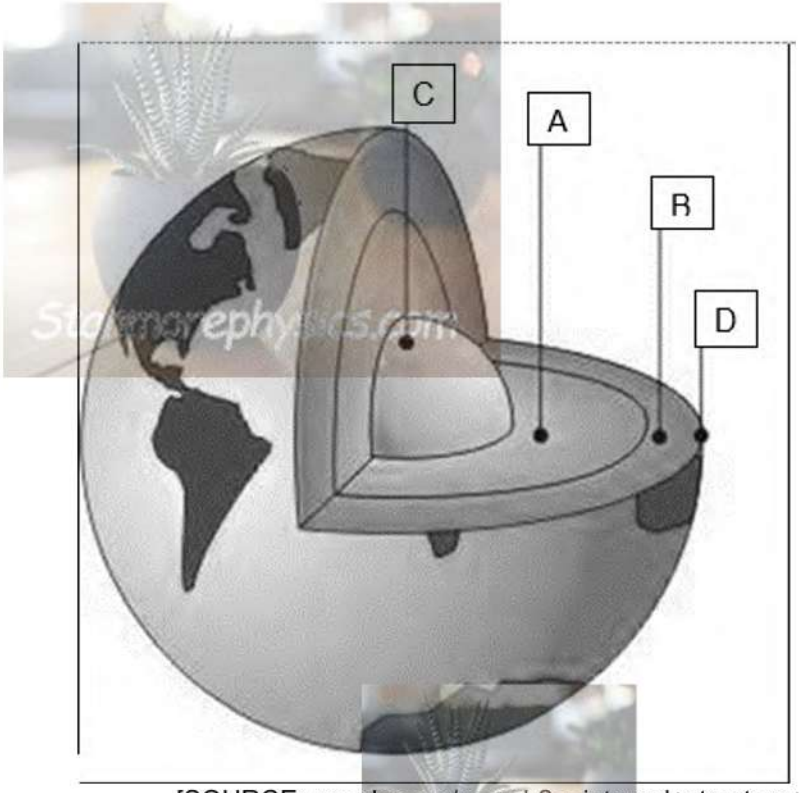
QUESTION 2: GEOMORPHOLOGY

2.1 Choose a term from COLUMN B that matches the description in COLUMN A. Write only the letter (Y or Z) next to the question number (2.1.1 – 2.1.7) in the ANSWER BOOK, for example 2.1.8 Y.

COLUMN A	COLUMN B
2.1.1 This rock is formed when magma solidifies.	**Y** Igneous rock **Z** Sedimentary rock
2.1.2 Igneous … form when lava flows on the surface.	**Y** intrusions **Z** extrusions
2.1.3 These are types of rocks that change their material composition due to immense pressure and temperature.	**Y** Metamorphic rocks **Z** Sedimentary rocks
2.1.4 … is the process whereby rocks break down into smaller pieces.	**Y** Deposition **Z** Weathering
2.1.5 … are the main minerals found in the oceanic crust.	**Y** Silicon and Aluminium (SIAL) **Z** Silicon and Magnesium (SIMA)
2.1.6 This is a characteristic of a sedimentary rock.	**Y** Stratified (layered) **Z** Crystalised
2.1.7 This type of rock is easily eroded.	**Y** Igneous rock **Z** Sedimentary rock

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2.2 Study the figure showing layers of the earth. Choose the correct letter (A – D) which matches the correct statements below. Letters may be used more than once.



[SOURCE: google.com/search?q=internal+structure+of+the+earth&tbm]

2.2.1 This layer is broken into smaller segments, called plates.

2.2.2 This layer has the highest temperatures.

2.2.3 This layer is thicker beneath the continents but thinner beneath the ocean.

2.2.4 This layer is in a molten state.

2.2.5 Tectonic plates float on this layer.

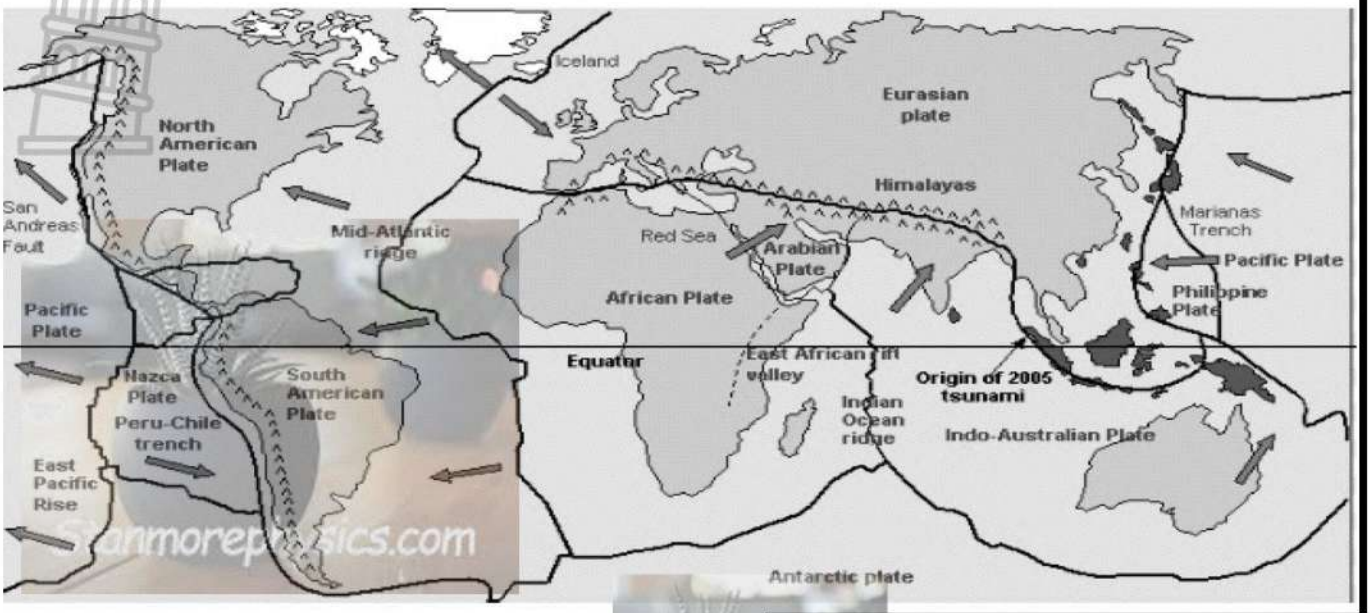
2.2.6 This layer is liquid due to high temperature.

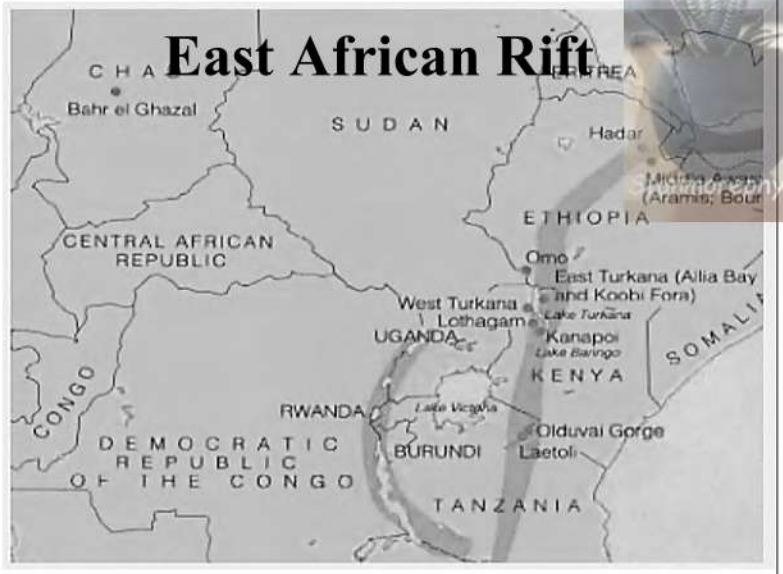
2.2.7 Topsoil is found in this layer.

2.2.8 This layer is separated by the moho from the mantle.

(8 x 1) (8)

2.3 Refer to the infographic on plate tectonics and the East African Rift Valley.





A rift valley refers to a lowland region where tectonic plates rift or move apart. The large crack that recently exposed itself in Kenya is from the East African Rift. In the 3,700 mile- long East African Rift, there are two smaller systems called the Gregory Rift and the Western Rift, and each is speckled with volcanoes.

The rifts are growing larger as two tectonic plates, the Somali plate in the east and the Nubian plate in the west, move away from each other.

[Source: www.geolsoc.org.uk]

2.3.1 Define the concept *plate boundary*. (1 x 2) (2)

2.3.2 Give the name of the geophysicist who first theorised the movement of tectonic plates. (1 x 2) (2)

2.3.3 Name the TWO plates responsible for the formation of the rift valley. (2 x 1) (2)

2.3.4 What type of plate boundary is responsible for the East African Rift?

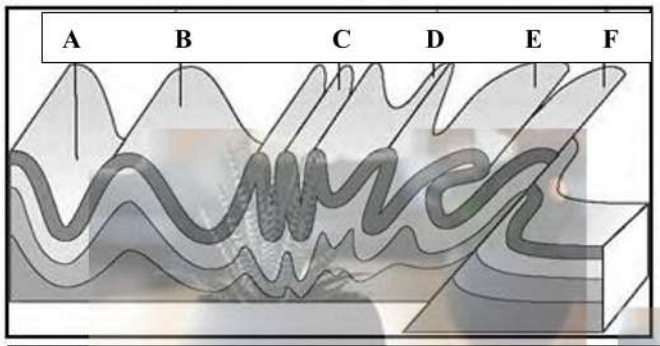
(1 x 1) (1)

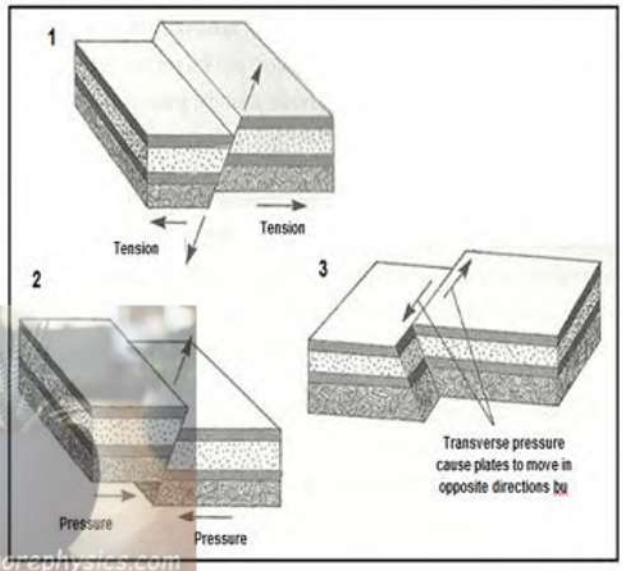
2.3.5 Explain ONE positive and ONE negative effect of the east African Rift Valley for the people of nnorth-eastern Africa. (2 x 2) (4)

2.3.6 Discuss 2 pieces of evidence that support the theory that all continents were once joined as one supercontinent (2 x 2) (4)

[15]

2.4 Study the infographic.





The movement of the Earth's plates leads to rocks being compressed into each other, and this in turn leads to the formation of folds and faults.
Folds form when the layers of rock bend around, and faults occur where rock layers actually break, and in some cases slide over each other.

Source: https://www.geoworldtravel.com/Folds-

2.4.1 Identify the fault types labelled **1, 2** and **3.** (3 x 1) (3)

2.4.2 Identify the parts of a fold labelled at **A** and **B**. (2 x 1) (2)

2.4.3 Name the mountain range in South Africa that developed because of rocks compressed into each other. (1 x 2) (2)

2.4.4 Differentiate between the processes of folding and faulting. (2 x 2) (4)

2.4.5 Explain why fold **C** is considered symmetrical fold. (1 x 2) (2)

2.4.6 Explain the development of fold **F.** (1 x 2) (2)

[15]

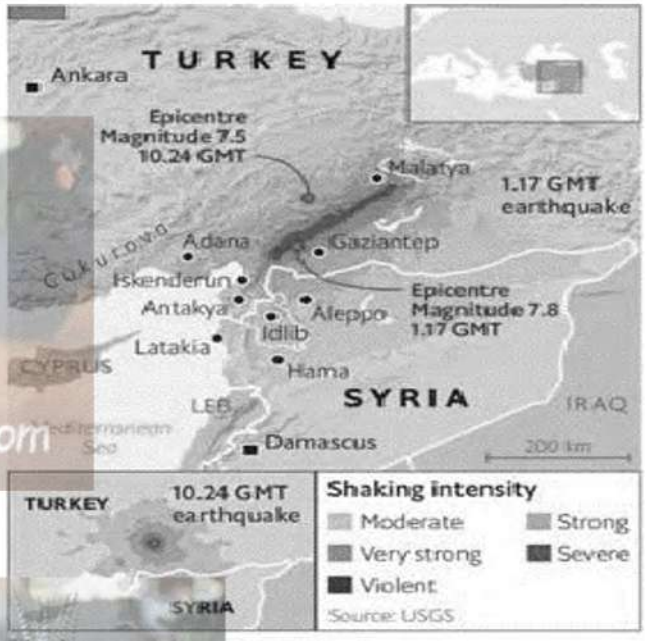
2.5 Refer to the extract on a recent earthquake in Turkey and Syria on 6 February 2023.

EARTHQUAKE IN TURKEY AND SYRIA ON 06 FEBRUARY 2023

Earthquakes may trigger other natural disasters including volcanic activity, tsunamis and landslides. Earthquakes may sometimes be referred to as tremors, or temblors.

Severe earthquakes may move the ground enough to cause buildings to collapse and kill thousands of people. During the shaking, it is prudent to drop down on the knees and cover the head and neck using hands. This protects against falling objects. Staying away from windows, furniture or any loose structures is prudent.

Earthquakes may also lead to flooding and outbreak of fires due to electrical lines. a Mw 7.8 earthquake struck southern and central Turkey and northern and western Syria. The epicentre was 37 km (23 mi) west—northwest of Gaziantep.



https://www.google.com/search?q=earthquake

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2.5.1 Define the concept *epicenter*. (1 x 2) (2)

2.5.2 State the magnitude of the earthquake in the extract. (1 x 1) (1)

2.5.3 List other natural disasters that may be triggered (caused) by an earthquake (2 x 1) (2)

2.5.4 According to the article, explain how people may protect themselves "during the shaking". (1 x 2) (2)

2.5. In a paragraph of approximately 8 lines discuss the reasons why the impacts of earthquakes will be more devastating in developing countries than developed countries. (4 x 2) (8)

[15]

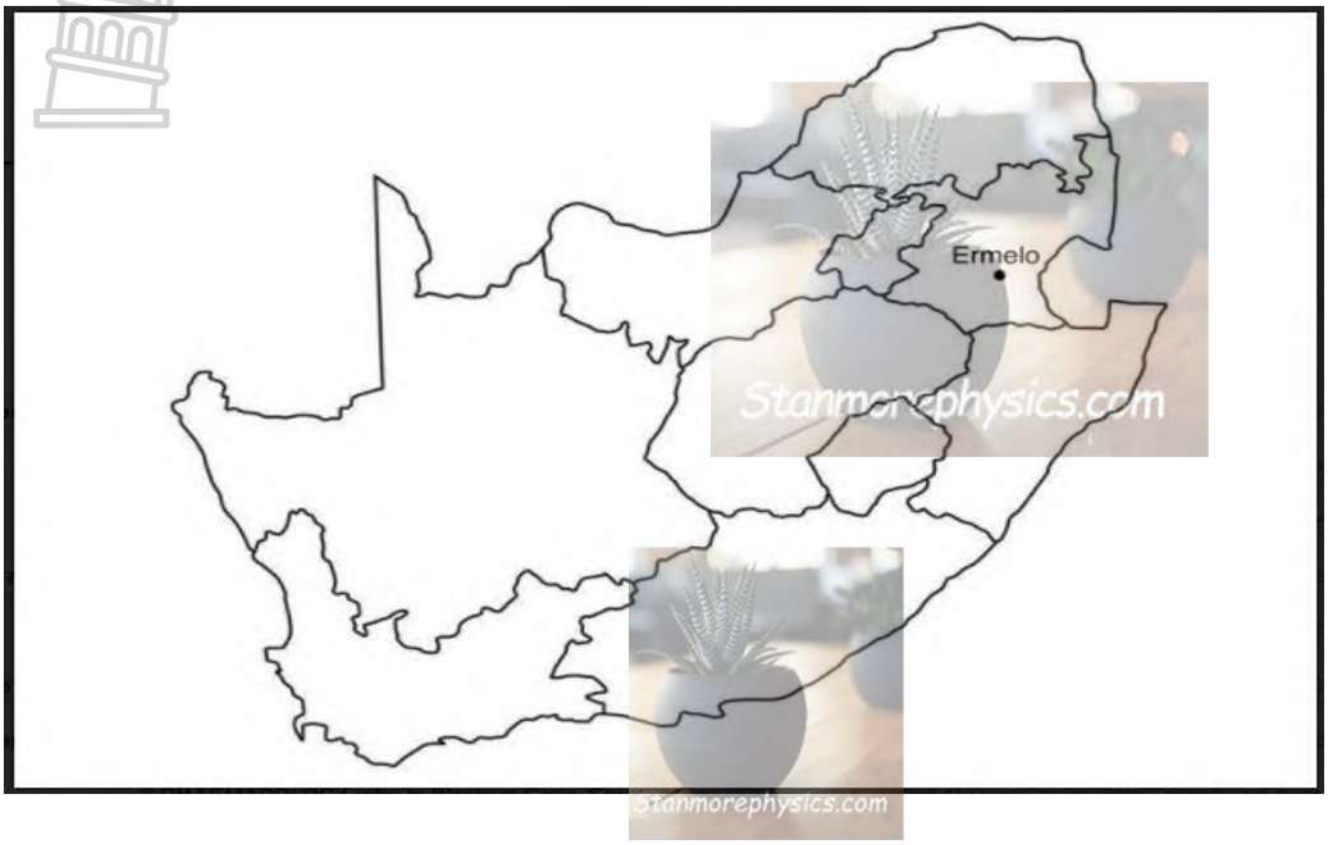
TOTAL QUESTION 2 [60]

TOTAL FOR SECTION A [120]

SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

BACKGROUND INFORMATION ON



26° 30'S, 29° 55'E

GENERAL INFORMATION ON ERMELO

Ermelo is an educational, industrial, and commercial town in the 7,750 km² Gert Sibande District Municipality in Mpumalanga, South Africa. It is located 120 km east of Johannesburg. It is both a mixed agriculture and mining region. Mixed farming, such maize, and cattle, takes place within the district. Mining is important to the district with anthracite, coal and torbanite being mined.

3.1 MAP SKILLS AND CALCULATIONS

The questions below are based on the 1: 50 000 topographical map (2629DB ERMELO) as well as the 1 :10 000 orthophoto map (2629DB 5 ERMELO)

3.1.1 Ermelo is situated in the … province

A Limpopo
B Gauteng
C Mpumalanga
D Kwazulu Natal (1 x 1) (1)

3.1.2 A tourist will travel in a/an … direction from Ermelo to Johannesburg.

A South Easterly
B Westerly
C Easterly
D South westerly (1 x 1) (1)

3.1.3 What is the height indicated by the trigonometrical station in **Block D2** on the topographical map? (1 x 1) (1)

3.1.4 Calculate the distance in km, between spot height 1738 in **Block B1** and the reservoir in **Block B2** on the topographical map. (1 x 2) (2)

3.1.5 Give the exact position of the windpump at **G** in **Block B3.** (4 x 1) (4)

3.1.6 How many times has reality on the topographic map 2629DB Ermelo been reduced. (1 x 1) (1)

3.2 MAP ANALYSIS AND INTERPRETATION

3.2.1 The transport route to Piet Retief in block C5 is……

A Other Railway
B National Route
C National Freeway
D Arterial Route (1 x 1) (1)

3.2.2 Give an example of a farming practice in Ermelo. (1 x 1) (1)
.

3.2.3 Explain the purpose of the feature marked **6** on the orthophoto. (2 x 1) (2)

3.2.4 Cassim Park in Blocks **E1** and **E2, on the orthophoto** is located on a gentle slope. Provide evidence from the orthophoto map to support this statement (1 x 2) (2)

3.2.5 Determine the feature that is located at the following grid reference 26˚31'54"S;29˚57'25"E. (1 x 2) (2)

3.2.6 Explain why the area of Wesselton appears bigger on the orthophoto map compared to the topographic map (1 x 2) (2)

Refer to the river in **Block D3** on the topographical map

3.2.7 (a) In which direction is the river flowing? (1 x 1) (1)

(b) Provide evidence from the topographic map to support your answer to question 3.2.7 (a). (1 x 1) (1)

3.3 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

3.3.1 Define the concept *Geographic Information System* (1 x 2) (2)

3.3.2 Give any two components of GIS. (2 x 1) (2)

Refer to **Block D1** and **Block E1** on topographical map.

Give an example of the following:

3.3.3 (a) A natural line feature (1 x 1) (1)

(b) A human-made polygon (1 x 1) (1)



3.3.4 Explain briefly why the orthophoto map can be classified as raster data. (1x2) (2)

TOTAL SECTION B: [30]

GRAND TOTAL: 150