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SEDIBENG EAST

NOVEMBER EXAMINATION 2024

SUBJECT	:	GEOGRAPHY
GRADE	:	10
TERM	:	4
TIME	:	3 HOURS
TOTAL	:	150
DATE OF IMPLEMENTATION	:	5 NOVEMBER 2024

This exam paper consists of 19 pages

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INSTRUCTIONS AND INFORMATION

1. This question paper consists of TWO SECTIONS:

   SECTION A:
   QUESTION 1: Climate and Weather (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 and a magnifying glass
12. Write neatly and legibly.

SPECIFIC INSTRUCTIONS AND INFORMATION FOR SECTION B

13. Question 3 Mapwork is based on the 1: 50 000 2529CC EMALAHLENI topographical map and 1: 10 000 2529CC orthophoto map. For the purposes of this exam snippets (parts) of the topographical map and orthophoto has been provided in the question paper.

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

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SECTION A: CLIMATE AND WEATHER AND GEOMORPHOLOGY

QUESTION 1: CLIMATE AND WEATHER

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, e.g. 1.1.9 D.

1.1.1. The layer of gas surrounding the earth on which all life depends is called the…

A. lithosphere
B. atmosphere
C. hydrosphere
D. biosphere

1.1.2. … is an example of a permanent gas found in the atmosphere.

A. ozone
B. methane
C. nitrogen D. sulphur dioxide.

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1.1.3. The process whereby the lowest parts of the atmosphere is heated by contact with the warm earth surface is known as…

A. convection
B. reflection
C. conduction
D. absorption

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1.1.4. Mountains are colder than low lying areas because the …

A. temperature of warm air increases with height.
B. rising cold air decrease in temperature with height.
C. temperature of warm air decreases with height.
D. warm air subsides with height.

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1.1.5. The amount of water vapour in the air compared to how much water vapour the air can hold is called…

A. Absolute humidity
B. Condensation
C. Dew point temperature
D. Relative humidity

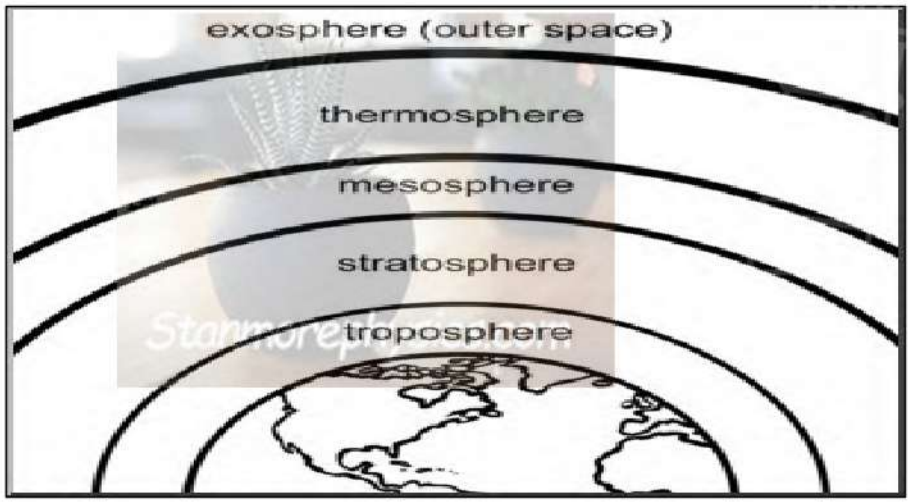
1.1.6. Cumulonimbus clouds are associated with …

A. thunderstorms
B. fine weather
C. slight drizzle
D. light rain

1.1.7 The temperature at which the condensation of water vapour takes place is known as …

A. condensation.
B. evaporation.
C. sublimation.
D. dew point temperature. (7x1) (7)

1.2. Study the sketch on the layers of the atmosphere.



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1.2.1. Identify the layer where ozone is mostly found.

1.2.2. Name the layer responsible for protecting the earth against dangerous ultra-violet rays of the sun.

1.2.3. Identify the layer which separates the troposphere and stratosphere.

1.2.4. Name the layer where all weather producing processes occurs.

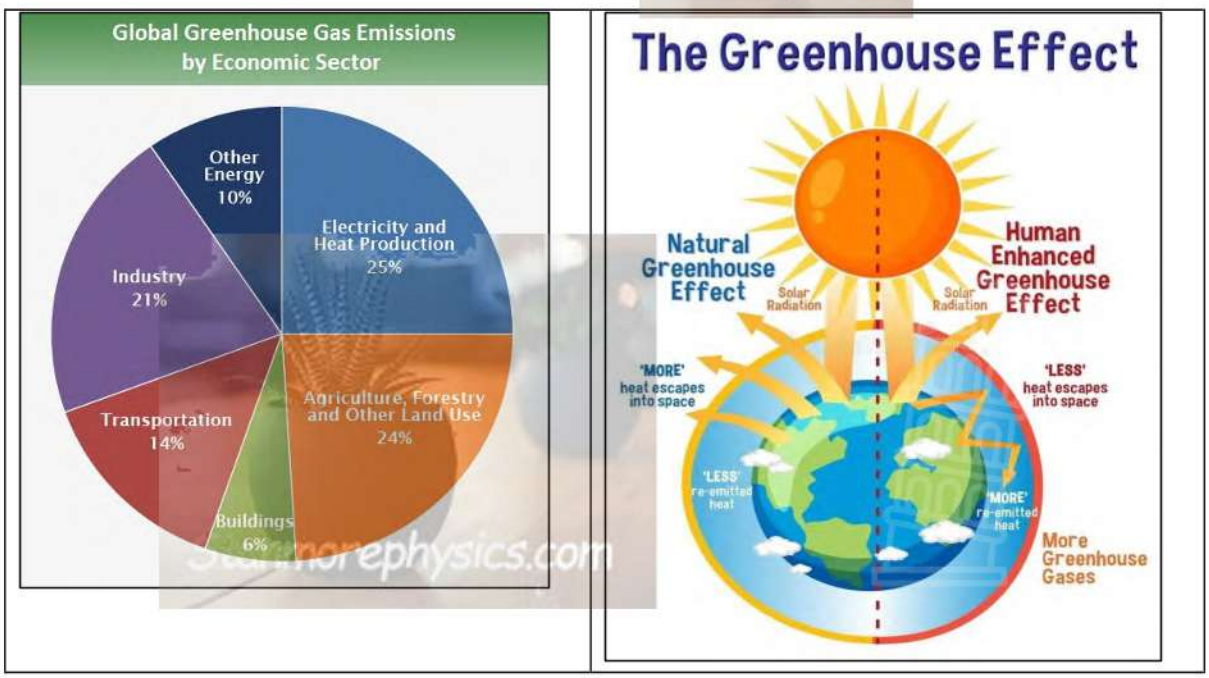
1.2.5. Which layer is responsible for protecting the earth against meteorites.

1.2.6. Identify the coldest layer of the atmosphere.

1.2.7. In which layer will oxygen be found?

1.2.8. In which layer will aircraft prefer to fly long distances? (8x1) (8)

1.3. Study the infographic on the greenhouse effect.



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1.3.1. Explain the concept the *greenhouse effect?* (1x2) (2)

1.3.2. According to the pie graph, which sector contributes the most to greenhouse emissions globally? (1x1) (1)

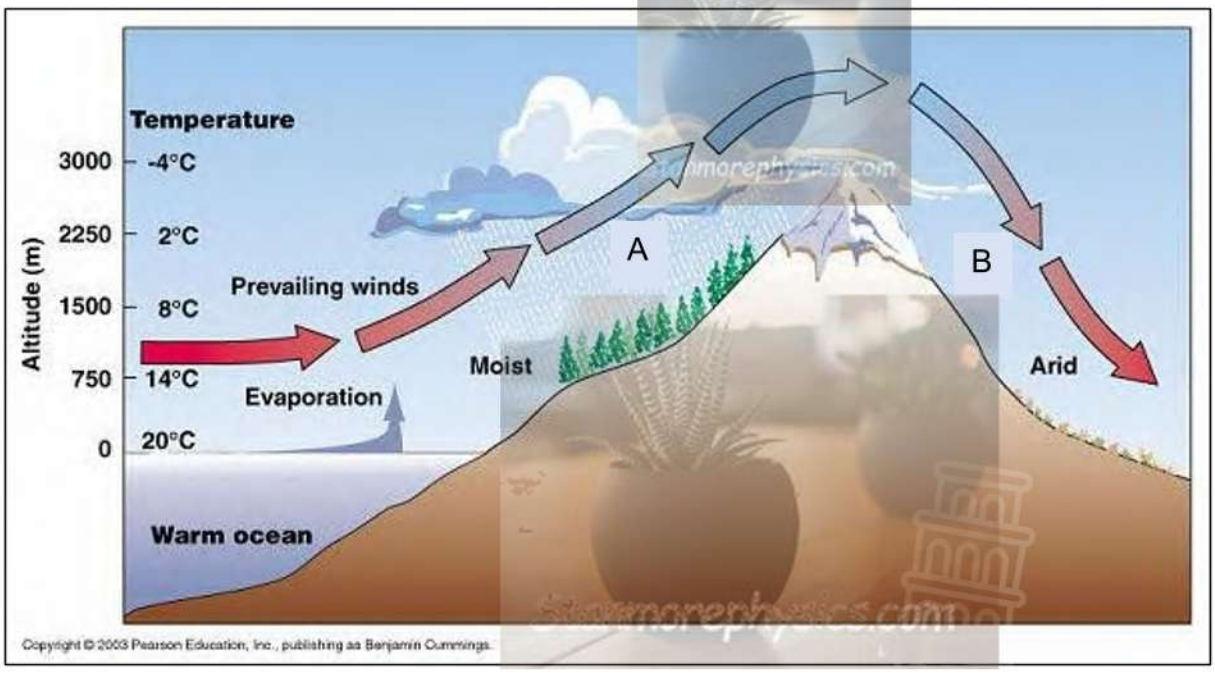
1.3.3. Name ONE greenhouse gas emitted by this sector. (Answer to 1.3.2.) (1x2) (2)

1.3.4. Explain how greenhouse gases into the atmosphere will have a negative impact on the environment. (2x2) (4)

1.3.5. Suggest THREE strategies the industrial and transport sector can implement to reduce the emission of greenhouse gases. (3x2) (6)

(15)

1.4 Study the sketch on a type of rainfall.



1.4.1. Identify the type of rainfall in the sketch. (1x1) (1)

1.4.2. On which side of the mountain is vegetation found (Windward or Leeward) (1x1) (1)

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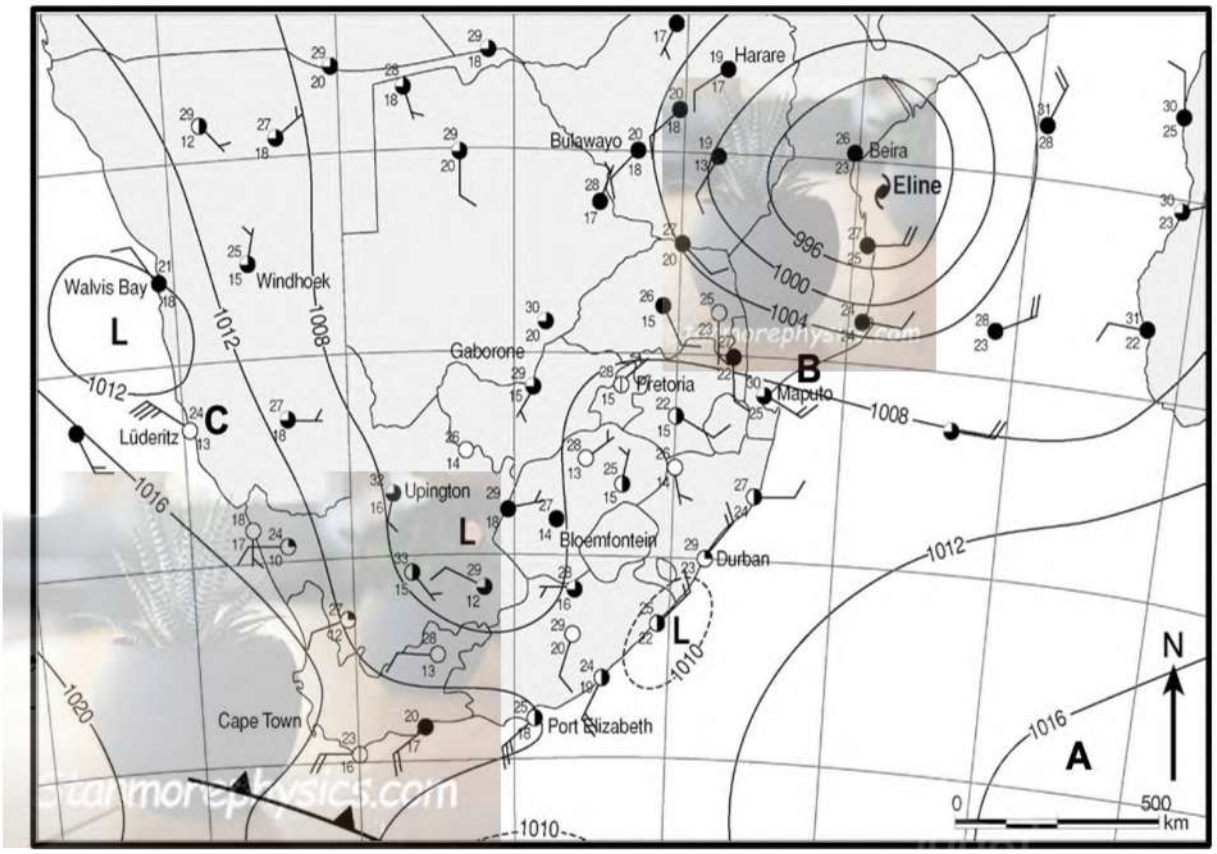
1.4.3. Give ONE reason why more vegetation will be growing on this side of the mountain. (Answer to Question 1.4.2.) (1x1) (1)

1.4.4. Refer to the picture and explain how this type of rainfall is formed. (2x2) (4)

1.4.5. In a paragraph of not approximately EIGHT lines explain the negative impact of this type of rainfall on side **A** of the mountain will have on the people and environment. (4x2) (8)

(15)

1.5. Study the synoptic map.



1.5.1. What is a synoptic weather map? (1x1) (1)

1.5.2. What is the season of the map? (1x1) (1)

1.5.3. Give ONE reason for your answer to question 1.5.2. (1x2) (2)

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1.5.4. What type of pressure cell is found at A on the synoptic weather map? (1x2) (2)

1.5.5. Study the weather station of Lüderitz at C on the synoptic map and state the:

(a) cloud cover (1x1) (1)

(b) windspeed (1x1) (1)

© wind direction (1x1) (1)

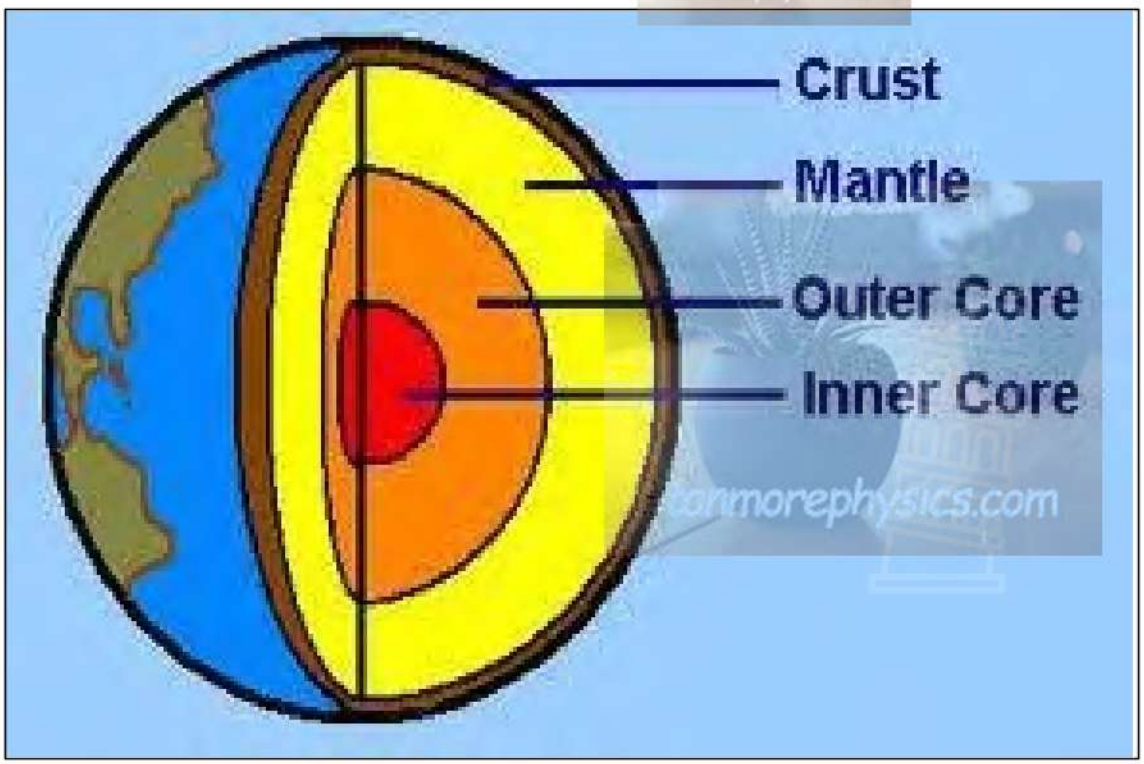
1.5.6 Compare the difference in air temperature between Lüderitz (24ºC) and Durban (29ºC) and explain the reasons for your answer. (3x2) (6)

(15)

[60]

QUESTION 2: GEOMORPHOLOGY

2.1. Study the diagram on the structure of the earth. Give ONE term that best describe each of the descriptions below. Write only the term next to the question number (2.1.1) in the ANSWER BOOK. The same term may be used for more than one answer.



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2.1.1. This layer is semi molten and about 2900 km thick

2.1.2. A very solid layer and the depth of this layer varies between 10 km and 70 km .

2.1.3 This layer is extremely hot and solid because of extreme pressure.

2.1.4. Nickel and Iron is found in this layer.

2.1.5. This layer is thicker under the continents and thinner under the oceans.

2.1.6. Continental Plates drift on this layer.

2.1.7. This layer is mostly formed of granite.

(7x1) (7)

2.2. Match the terms in COLUMN B with the descriptions in COLUMN A. write only the correct letter (A–H) next to the corresponding question number. (2.2.1–2.2.8) in the ANSWER BOOK, for example, 2.2.8 K.

	COLUMN A		**COLUMN B**
2.2.1	A rock that has been changed by heat, pressure or both	A	Fold mountain
2.2.2	An example of igneous rock	B	Sedimentary rock
2.2.3	Metamorphic rock which changes from granite	C	Metamorphic rock
2.2.4	Rocks which form when magma cools	D	Granite
2.2.5	Rocks which forms from plants and animals that were once alive.	E	Gneis
2.2.6	Remains of plant and animals	F	Igneous rocks
2.2.7	Mountains formed by the compression of sedimentary rock strata during plate movement	G	Anticline
2.2.8	The bottom part of a fold	H	Fossils

(8x1) (8)

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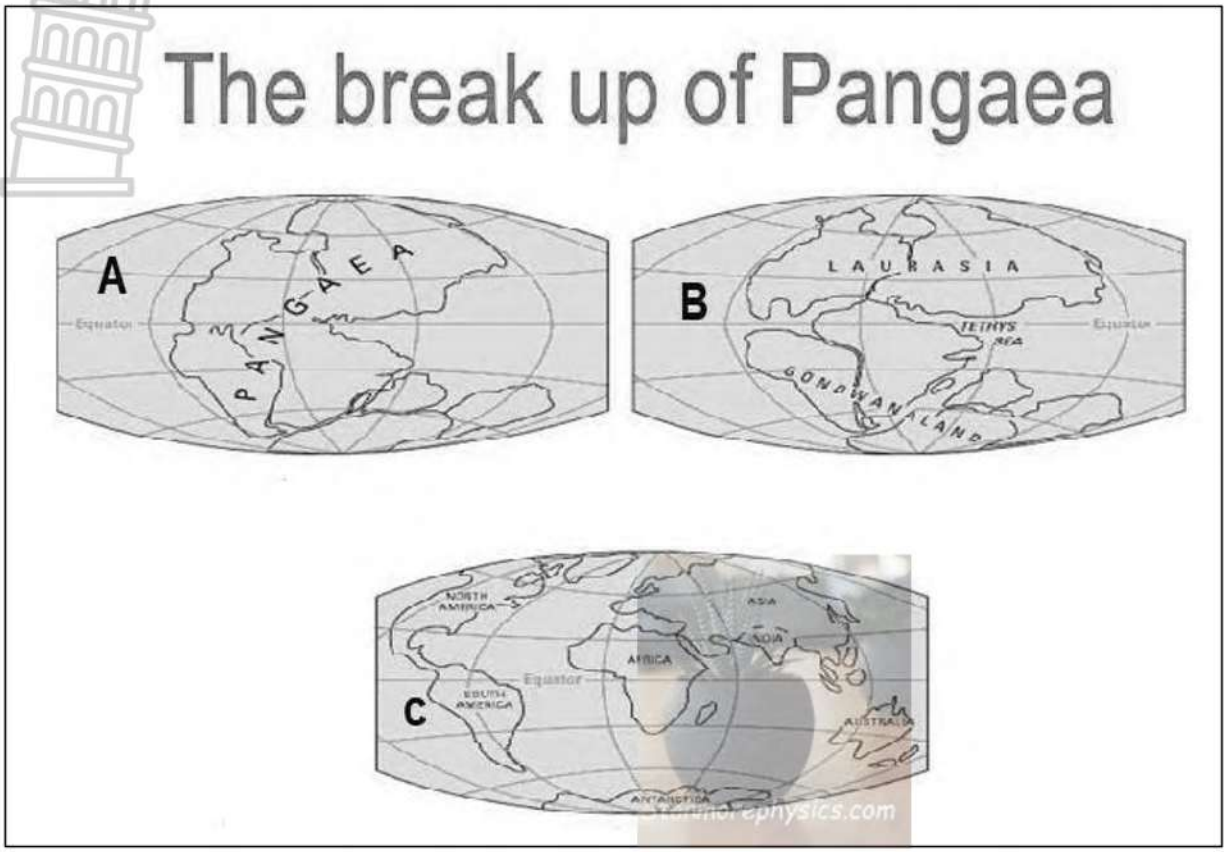
2.3. Study the sketch on Continental drift.



2.3.1. What are *plate tectonics*? (1x2) (2)

2.3.2. Name the original landmass that existed 250 million years ago. (1x1) (1)

2.3.3. Name the TWO landmasses found in the north and south respectively when this large landmass split. (2x1) (2)

2.3.4. Name any TWO of the present-day continents that used to be part of the south when the big landmass split. (2x1) (2)

2.3.5. Explain FOUR pieces of evidence to prove the theory that the continents were once joined together. (4x2) (8)

(15)

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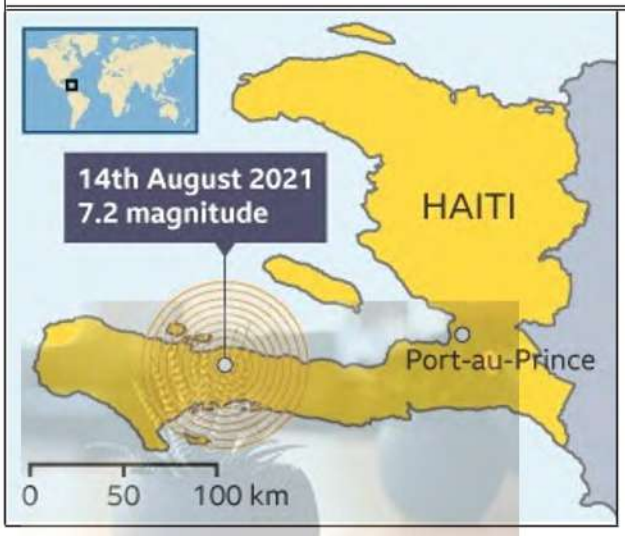
2.4. Study the infographic on the Haiti earthquake.

Case Study: Haiti Earthquake, 2021

On 14th August 2021 a magnitude 7.2 earthquake struck Haiti in the Caribbean. The plate boundaries around Haiti are complex. The North American Plate lies to the north and the Caribbean Plate to the south. The earthquake took place at a conservative plate boundary, where the Caribbean plate moved eastwards. The focus was only 10 km deep, and the epicentre was 125 km from the capital Port-au-Prince. Years of exploitation from outside countries, dating back to the enslavement of the island's people after Christopher Columbus arrived in 1492, and political unrest within Haiti have resulted in the country's current standing as the poorest in Latin America. The unrest and poverty have translated to the development of the region, which is rife with substandard structures and building materials. Many structures use concrete, which is inexpensive and can be used to create heavy walls and roofs that resist hurricane winds. But much of the region's concrete is unreinforced, and it readily crumbles under the shaking of earthquakes.





2.4.1. What is an *earthquake*? (1x2) (2)

2.4.2. Where in Haiti did the earthquake occur? (1x1) (1)

2.4.3. According to the article, the focus was only 10 km deep. Define the concept focus. (1x2) (2)

2.4.4. Explain the negative impact of this earthquake on the people living close to the epicentre of the earthquake. (2x2) (4)

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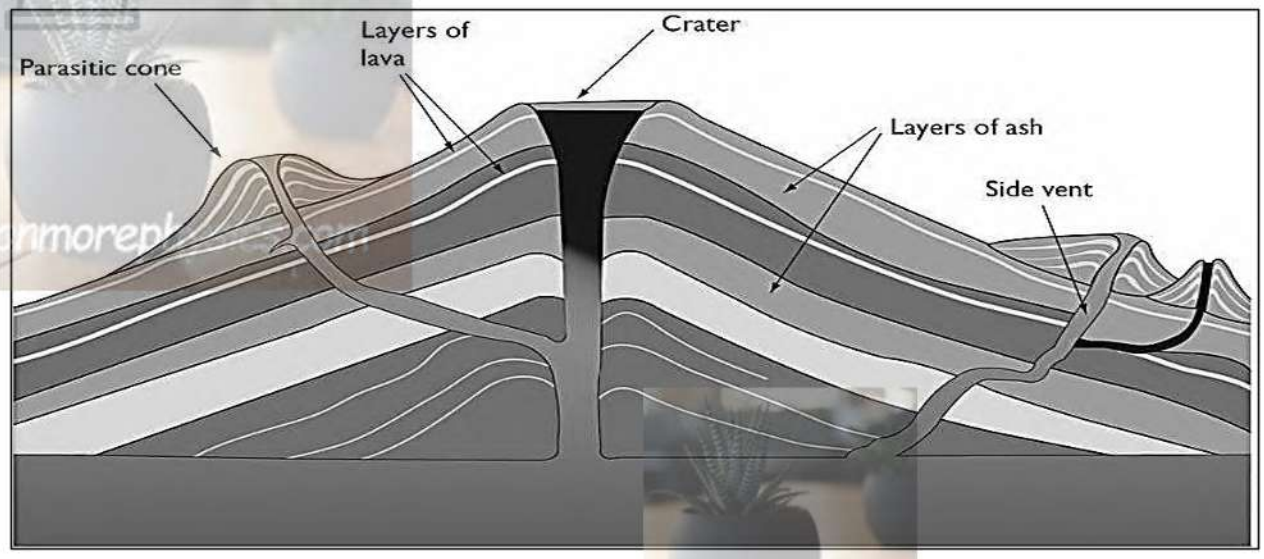
2.4.5. What strategies can the government of Haiti implement to reduce the impact of the earthquakes? (3x2) (6)

[15]

2.5. Study the sketch on a type of volcano.



[Source: Google image]

2.5.1. What is an *active volcano*? (1x2) (2)

2.5.2. Identify the type of volcano illustrated in the sketch. (1x1) (1)

2.5.3. Give one reason for your answer for QUESTION 2.5.2. (1x2) (2)

2.5.4. Briefly explain how a caldaria is formed (2x2) (4)

2.5.5. Explain the positive economic impact of volcanoes for a country. (3x2) (6)

[15]

[60]

TOTAL SECTION A: 120

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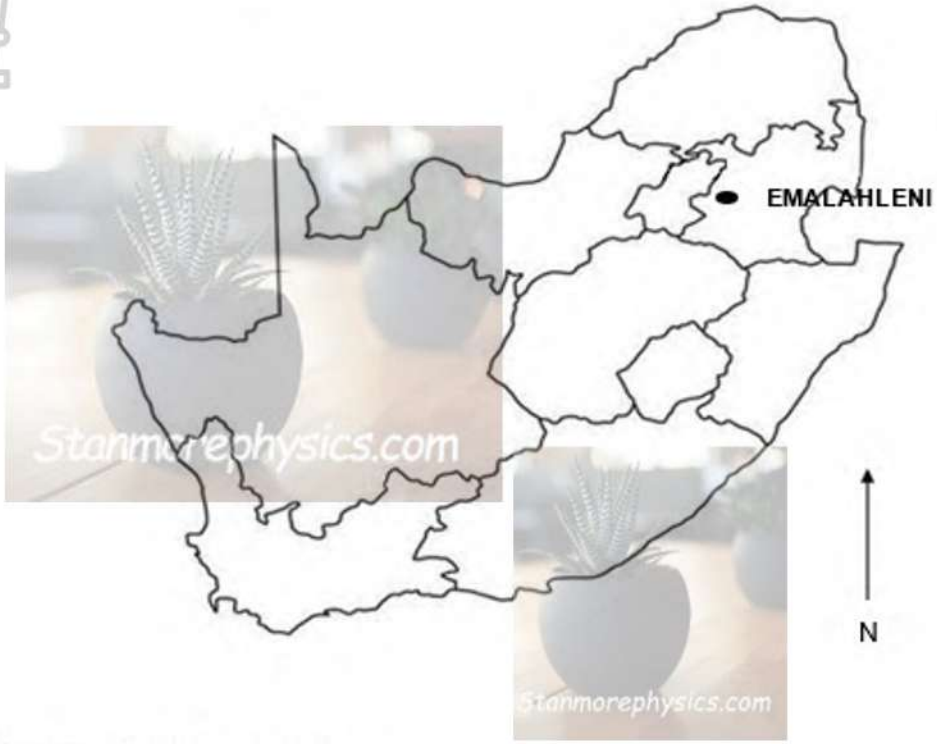
SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

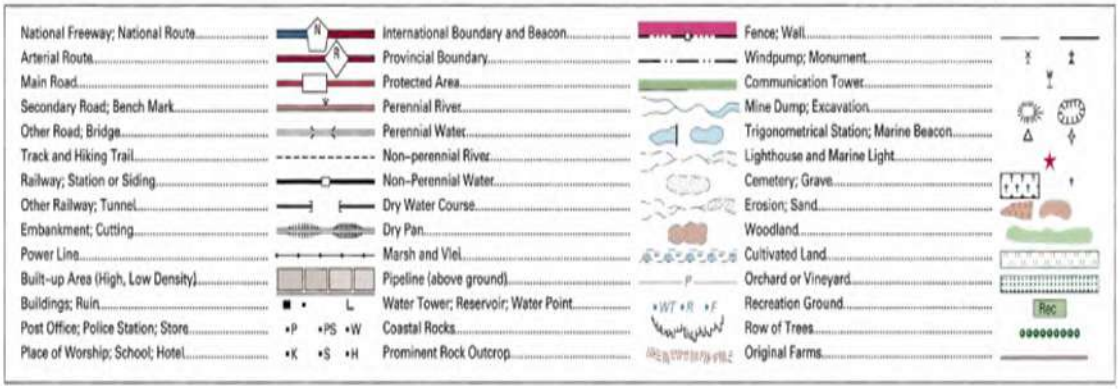
GENERAL INFORMATION ON EMALAHLENI



Coordinates: 25°50'S; 29°10'E

Emalahleni, formerly Witbank, is city, located to the east of Pretoria in Mmpumalanga province. It is at the centre of a coal-mining area in which more than 20 collieries operate. Witbank attained town status in 1910 and city status in 1994. The city has grown rapidly around heavy industry, and a power plant at the Witbank Dam supplies electricity to a wide area. The dam, its catchment, and neighbouring nature reserve host a variety of recreational activities. The city's name was officially changed to eMalahleni in 2006, and it is administered as part of the larger Emalahleni Local Municipality.

[Adapted from https://en.wikipedia.org/wiki/EmalahleniLocalMunicipality,Mpumalanga]



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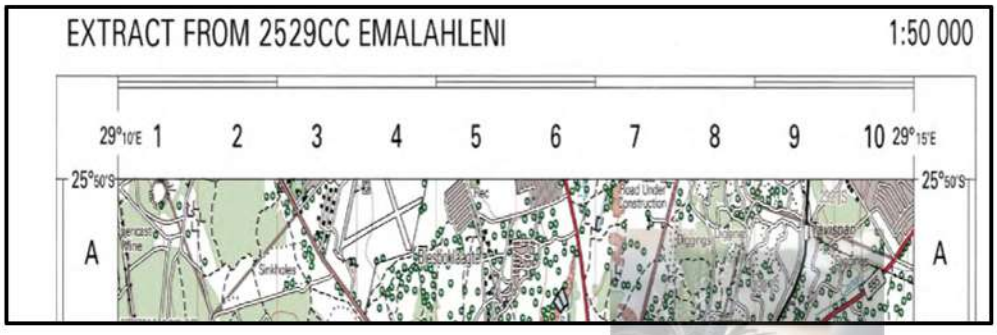
3.1 MAPWORK SKILLS AND CALCULATIONS

3.1.1 Emalahleni is located in the … provice

A Limpopo
B Northwest
C Mpumalanga
D KwaZulu-Natal (1 x 1) (1)

Refer to the insert below and answer questions 3.1.2 – 3.1.3



3.1.2 The **29** in the grid reference 2529 CC EMALAHLENI refers to the …

A latitude
B longitude
C equator
D Greenwich meridian (1 x 1) (1)

3.1.3 The scale 1:50 000 on the topographic map represents … m on earth.

A 0,5
B 50
C 500
D 5000 (1 x 1) (1)

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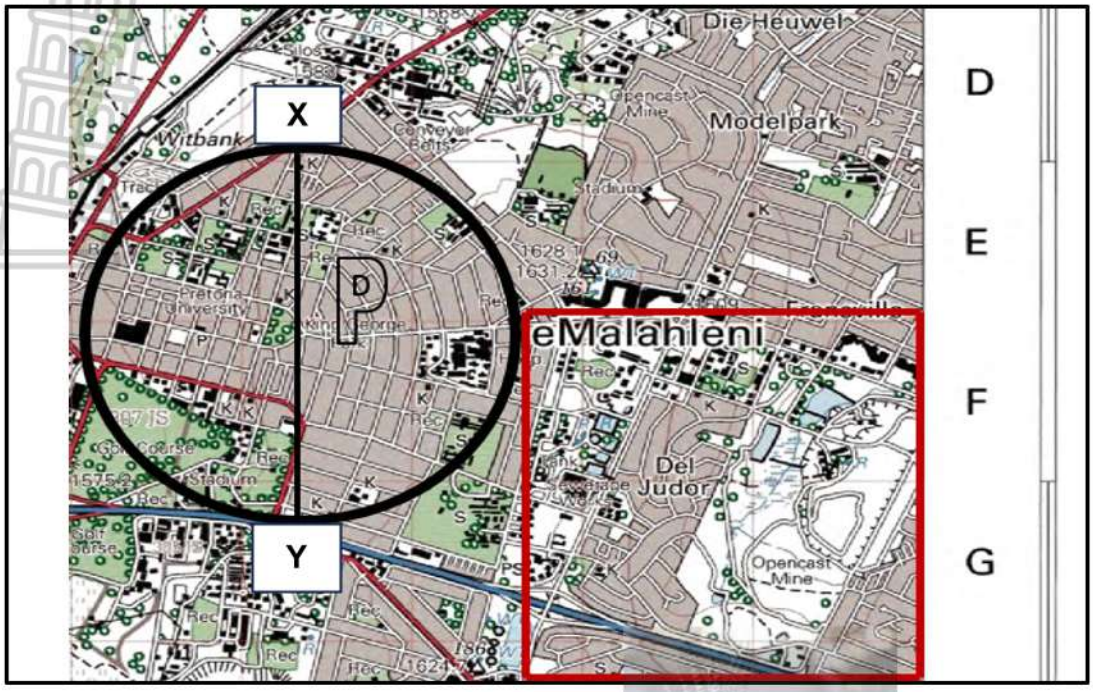
Refer to the insert below and answer question 3.1.3

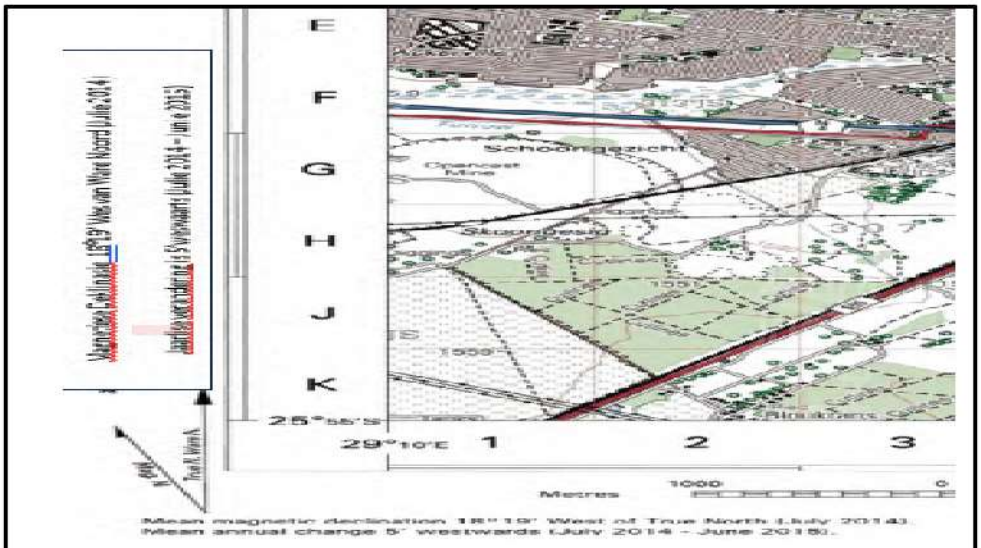


3.1.4 Calculate the diameter of circle P from **X** to **Y** on the topographic in Km. (The diameter /measurement from **X** to **Y** is 4.3 cm)

Formula : Distance = Map Distance x Scale

(3 X 1) (3)

Refer to the insert below and answer questions 3.1.4 – 3.1.6



Mean magnetic declination 18°19' West of True North (July 2014)
Mean annual change 5' westwards (July 2014 – June 2015)

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3.1.5 Use the above information to calculate the current difference in years. (1 x 1) (1)

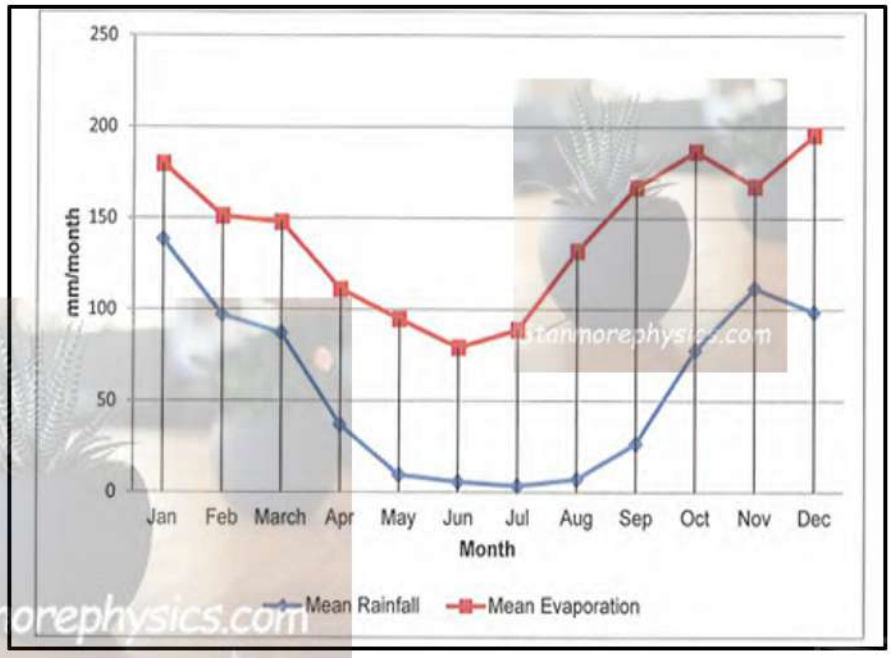
3.1.6 The annual change is 5' westwards. Calculate the mean annual change in 2023. (1 x 1) (1)

3.1.7 Use the answer to QUESTION 3.1.5 to calculate current magnetic declination. (2 x 1) (2)

[10]

3.2 MAPWORK INTERPRETATION

Refer to the graph below on Rainfall and Evaporation of Emalahleni and answer the following questions.



3.2.1 Emalahleni is situated on the Highveld of South – Africa and will receive (frontal / convectional) rainfall. (1 x 1) (1)

3.2.2 Identify in what season does Emalahleni receive rainfall. (1 x 1) (1)

3.2.3 In which month does Emalahleni receive the highest rainfall. (1 x 1) (1)

3.2.4 Compare the rate of evaporation with the number of rainfall according to the graph. (2 x 2) (4)

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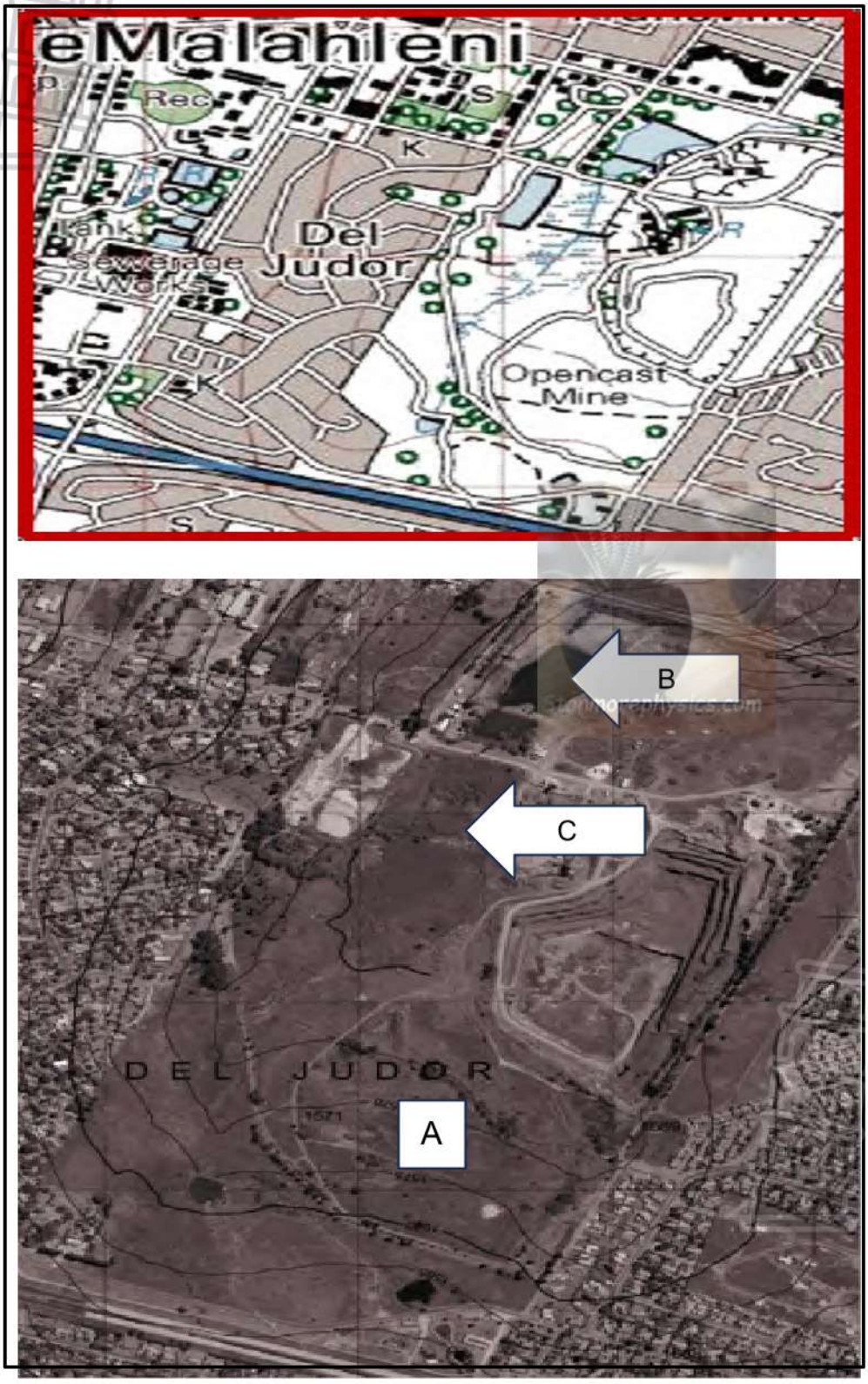
Refer to both the topographic and orthophoto map. The orthophoto map represents the eastern part of the Malahleni topographic map.



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3.2.5 Identify the following activities and features on the ortophoto map

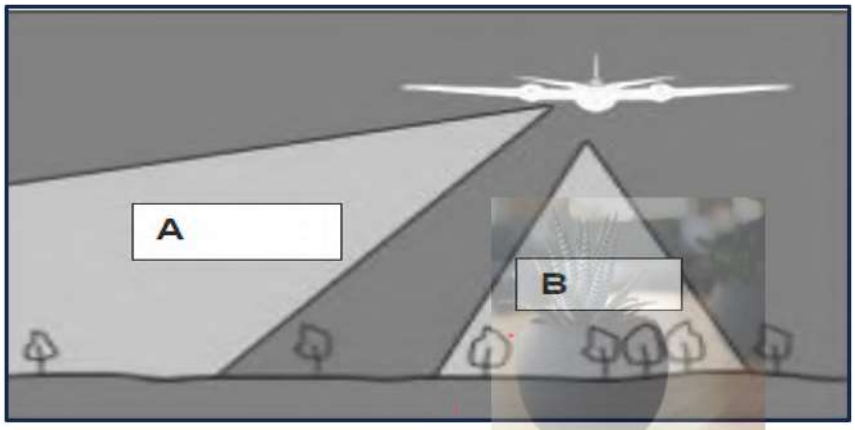
(a) the primary activity at **A**

(b) the man-made feature at **B**

(c) the natural feature at **C**

(3 x 1) (3)

Refer to the diagram below showing two types of aerial photographs.



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3.2.6 (a) The orthophoto map is a representation of aerial photo (**A/B**)

(b) Give ONE advantage of the type of photograph depicted by **A**

(2 x 1) (2)
[12]

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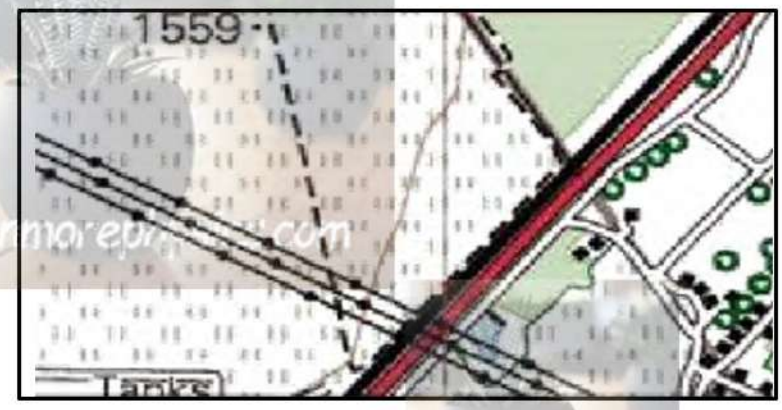
3.3 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

3.3.1 Define the concept of Geographical Information Systems. (1 x 2) (2)

3.3.2 Refer to the insert below from the topographical map. Vector data refers to real life images in the form of points, lines and polygons. Identify the following examples of vector data.

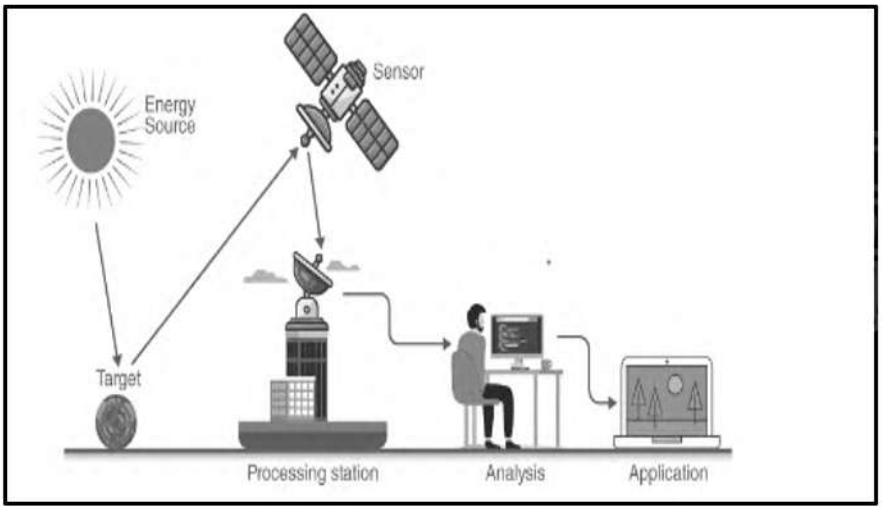


(a) A point feature

(b) A line feature

(c) A polygon feature (3 x 1) (3)

3.3.3 Refer to diagram below depicting a GIS process.



(a) The GIS process depicted in the diagram is (remote sensing/intervisibility). (1 x 1) (1)

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(b) Identify from the diagram if the satellite make use of active or passive remote sensing. (1 x 1) (1)

(c) List ONE advantage of the GIS process depicted in the diagram. (1 x 1) (1)

(8)

TOTAL: 30 MARKS
GRAND TOTAL: 150 MARKS

