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LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 11

GEOGRAPHY

MID-YEAR EXAMINATION

MAY/JUNE 2023

MARKS : 150

DURATION : 3 hours.

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This question paper consists of 20 pages.

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INSTRUCTIONS AND INFORMATION

1. This question paper consists of TWO SECTIONS:

   SECTION A:
   QUESTION 1: 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 the subsections 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. Answer in FULL SENTENCES, except when you have to state, name, identify or list.
8. Units of measurement MUST be indicated in your final answer, e.g 1020hPa, 14 °C and 45 m.
9. You may use a non-programmable calculator.
10. You may use a magnifying glass.
11. Write neatly and legibly.

SPECIFIC INSTRUCTIONS AND INFORMATION FOR SECTION B

12. Use the 1: 50 000 topographic map 2629DB from Ermelo and a 1:10 000 Orthophoto map 2629 DB 5 from Ermelo / 1: 50 000 topographic map 3224 BC GRAAFF REINET and a 1: 10 000 Orthophoto map 3224BC 01 GRAAFF REINET.
13. The area dermacated in RED /BLACK on the topographic map represents the area covered by the orthophoto map.
14. Show ALL calculations where applicable. Marks will be allocated for this.
15. You must hand in the topographic map and the Orthophoto map to the invigilator at the end of this examination.

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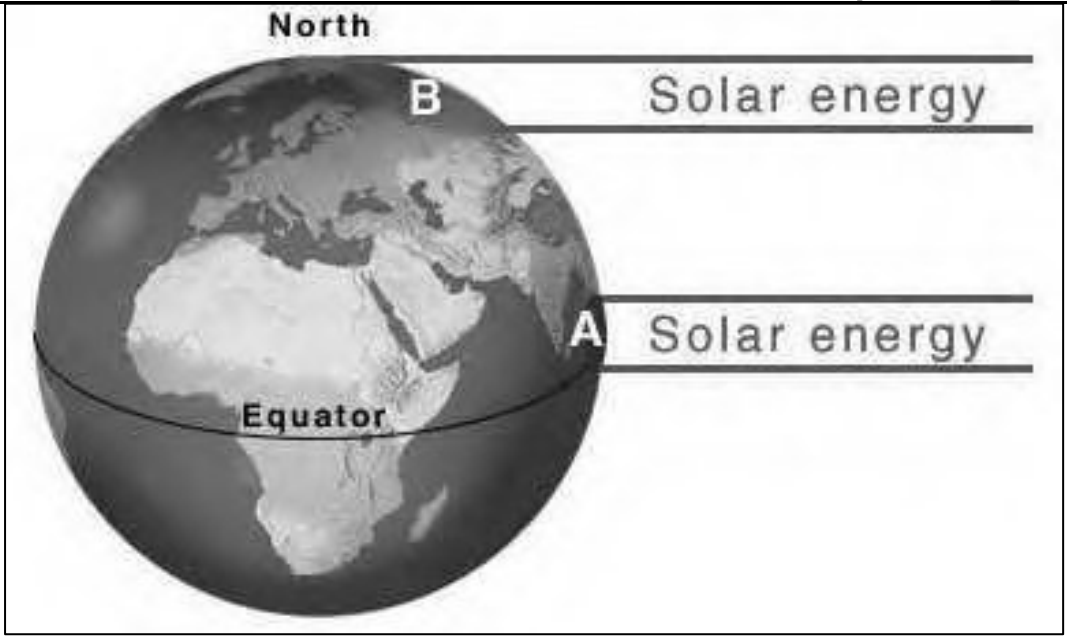
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SECTION A: THE ATMOSPHERE AND GEOMORPHOLOGY

QUESTION 1: THE ATMOSPHERE

1.1. Refer to FIGURE 1.1 which shows the different angles at which the sun's rays strike the Earth's surface to answer the following questions: Choose either A or B as your answers.

FIGURE 1.1: THE ANGLE AT WHICH THE SUN'S RAYS STRIKE THE EARTH



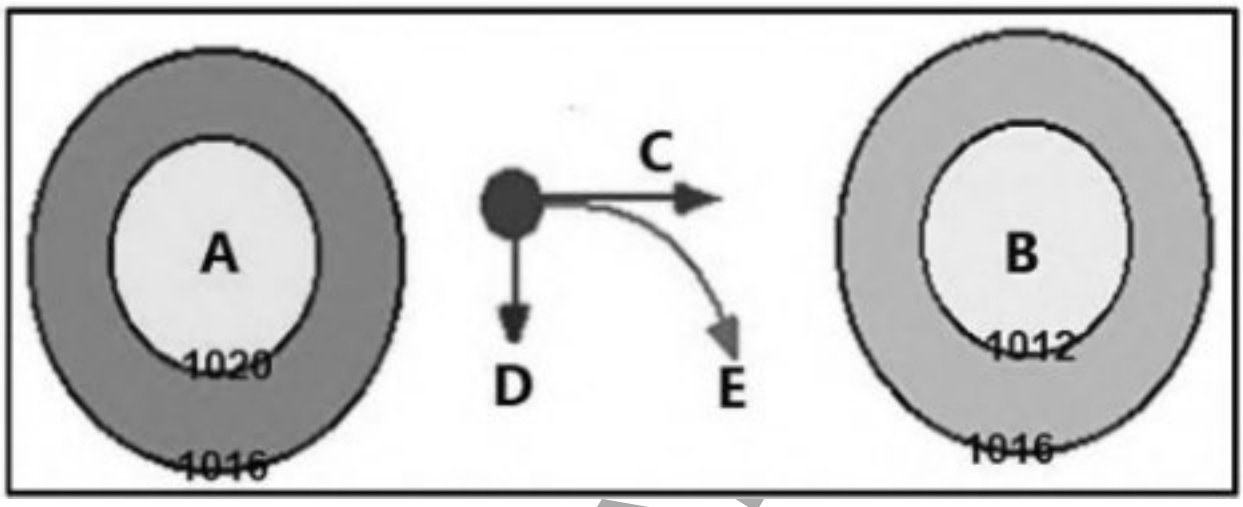
Source: google search

1.1.1. At which place do the sun's rays pass through a larger atmosphere than the other?
1.1.2. Where do the sun's rays spread over a larger surface?
1.1.3. At which place will the atmosphere be more intensely heated?
1.1.4. A place with a higher albedo.
1.1.5. A place where the sun's rays strike the earth at 90° angle.
1.1.6. The sun travels a longer distance before reaching this place.
1.1.7. This place receives insolation throughout the year (7x1) (7)

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1.2. Refer to the Figure below that shows the relationship between pressure gradient force and Coriolis force. Choose the correct word(s)/letter(s) from those given in brackets which will make each statement geographically CORRECT. Write only the words(s)/letter(s) next to the question numbers (1.2.1.-1.2.8) in the ANSWER BOOK.

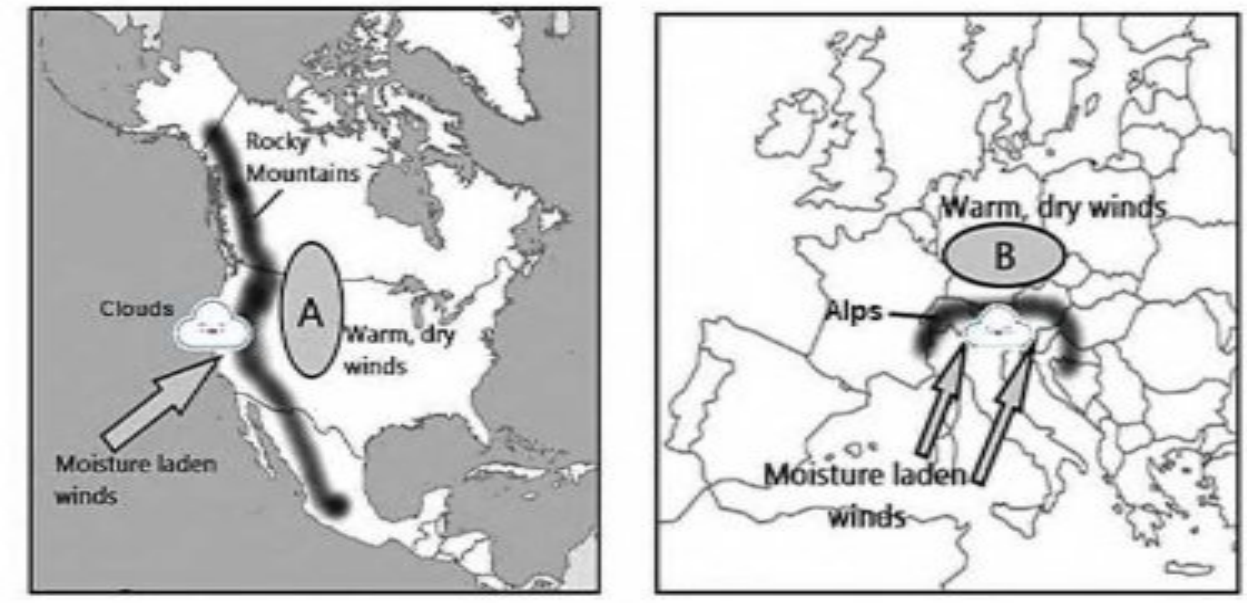


1.2.1. Winds blow flow from (A to B/B to A).
1.2.2. (Coriolis/pressure gradient) force determines the speed at which air moves.
1.2.3. A (Coriolis/pressure gradient) force causes winds to deflect or change direction in both hemisphere.
1.2.4. In the Southern hemisphere winds deflect to their (left/right).
1.2.5. A (geostrophic/monsoon) wind blows when the pressure gradient and Coriolis force is equal in strength.
1.2.6. Convergence is associated with a (low/high) pressure.
1.2.7. Subsidence is associated with a (low/high) pressure.
1.2.8. The pressure gradient is (steep/gentle) when isobars are far apart. (8x1) (8)

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1.3. Study the maps below showing warm, dry winds that blow over the North American and European continents.



1.3.1. Provide the local names of the warm, dry winds indicated by A and B in South Africa. (1 x 1) (1)

1.3.2. Is the wet adiabatic lapse rate found on the windward or leeward side? (1 x 2) (2)

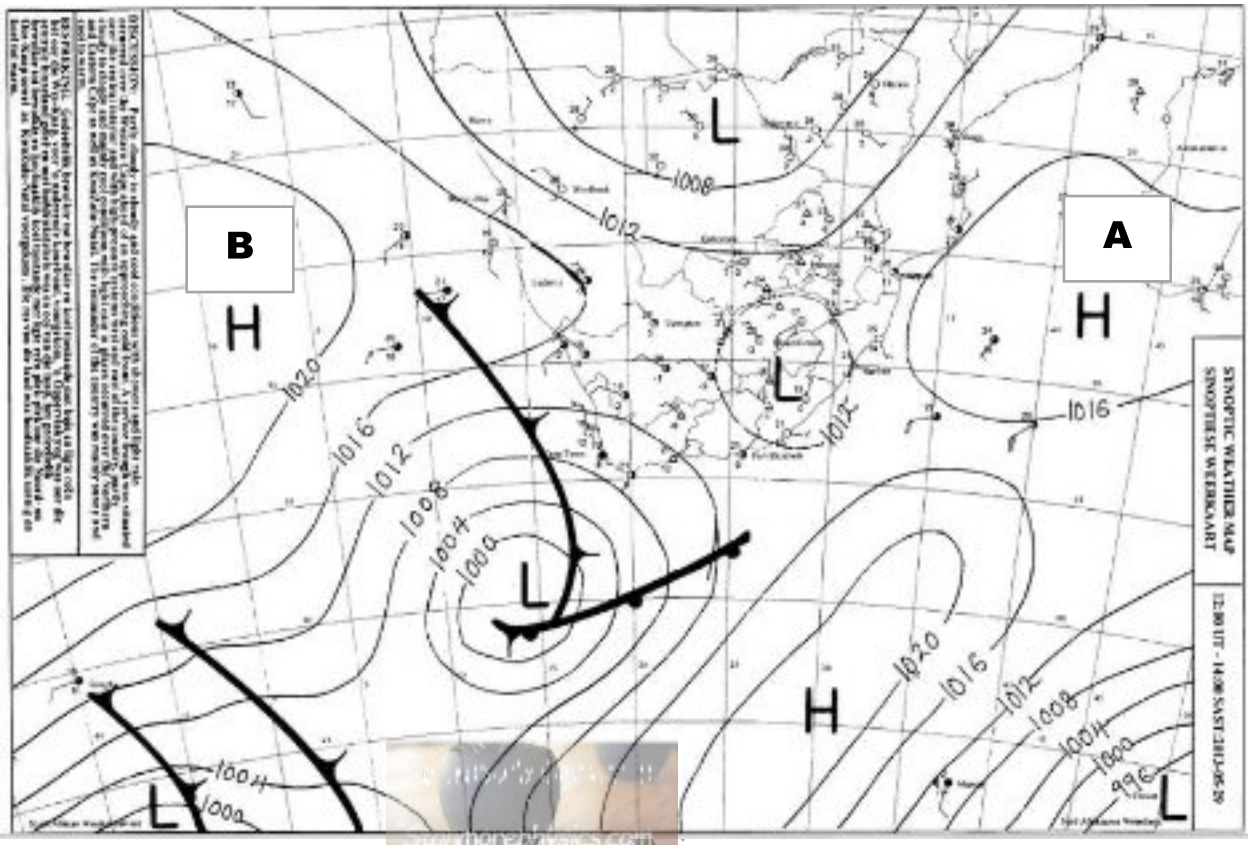
1.3.3. Why is the wind dry at A and B on the maps? (2 x 2) (4)

1.3.4. In a paragraph of approximately EIGHT lines, explain the influence that these warm, dry winds have on economic activities. (4 x 2) (8)

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1.4. Refer to the figure showing a synoptic weather map of southern Africa.



1.4.1. Give evidence that the synoptic weather map presents winter conditions. (1x1) (1)

1.4.2. Determine the isobaric interval on the synoptic weather map. (1x1) (1)

1.4.3. Name the high-pressure cell at A. (1x1) (1)

1.4.4. Give TWO general characteristics of high-pressure cell A. (2x2) (4)

1.4.5. How will the position of high-pressure cell B decrease the rainfall over the western part of the country? (2x2) (4)

1.4.6. Explain how the warm and cold ocean currents on the eastern and western side of South Africa would control the temperature of South Africa in winter. (2x2) (4)

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1.5. **Below is an extract on the effects of desertification in the Sahel region.**

THE EFFECTS OF DESERTIFICATION IN AFRICA

Desertification is a process that destroys fertile land. This can be caused by drought, overpopulation, over-farming, deforestation and climate change. The most vulnerable region is a 3 000-mile stretch of land that includes ten countries in the Sahel region of Africa. The Sahel is the area between the Sahara Desert and the Sudanian Savannah. This region is under constant stress due to frequent droughts and soil erosion. A dense forest can become a field of dust in a matter of years, making mass migrations inevitable. Africans frequently migrate south in search of fertile land.

Agriculture in Africa tends to result in low productivity, as most of the land is characterised as a semi-desert. Clearing the land of trees also reduces the structure of the soil. Coupled with wind erosion, the topsoil blows away and leaves a desert-like land.

The country that is arguably the most damaged by desertification is Senegal. Migrations in Senegal are common, as wind erosion, deforestation and climate change wreaks havoc on farms and livestock. Those most affected by desertification in Senegal move to Gabon, a country in West Africa, or even to Europe or South America. More than half of Senegalese work in agriculture, and desertification forces those with meagre profits to move elsewhere to escape poverty.

[Source: borgenprojects.org/desertification-in-africa]

1.5.1. According to the extract, state ONE human cause of desertification. (1x1) (1)
1.5.2. Name the region most vulnerable to desertification in Africa. (1x1) (1)
1.5.3. Why is fertile soil so important to the people of Africa? (1x1) (1)
1.5.4. What social impact would lack of fertile soil have on the people of Africa? (2x2) (4)
1.5.5. How does desertification in Senegal have a negative economic impact on other countries in Africa? (2x2) (4)
1.5.6. Suggest TWO management strategies that could be implemented to combat (reduce) the spread of desertification. (2x2) (4)

[60]

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QUESTION 2: GEOMORPHOLOGY

2.1. Match a term/word in COLUMN B with the descriptions in COLUMN A. Write ONLY the letter (A-I) next to the question numbers (2.1.1 – 2.1.8) in the answer sheet, e.g. 2.1.9 J.

COLUMN A	COLUMN B
2.1.1. a process whereby a ridge erodes in the direction of a dip slope 2.1.2. The three roundavels are an example of this 2.1.3. A process whereby a soft rock erodes quickly leaving a hard rock hanging 2.1.4. Volcanic rock that forms a plateau on the surface 2.1.5. Molten volcanic rock that erupts on the surface of the earth 2.1.6. This process is also known as back wasting 2.1.7. Landscapes that develop out of canyon landscape 2.1.8. A process in which rocks are broken up into smaller pieces by mechanical and chemical processes	A. Lava B. Scarp retreat C. Homoclinal shifting D. Butte E. Undercutting F. Basalt G. Weathering H. Hilly landscapes I. Karoo landscapes

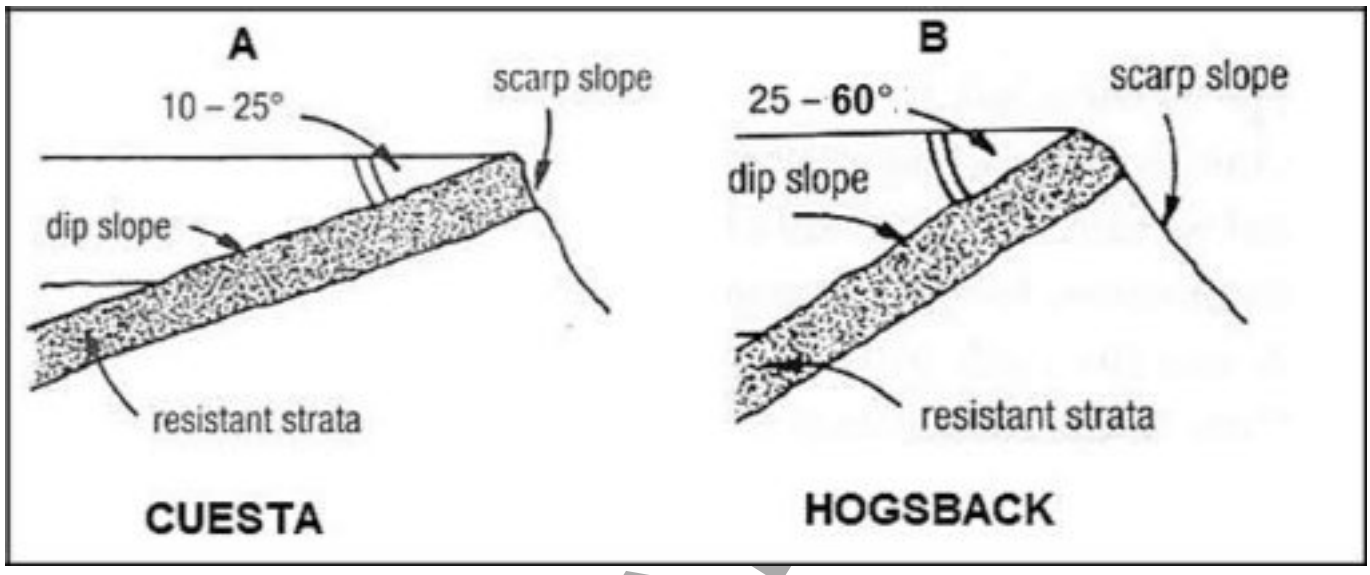
(8x1) (8)

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2.2. Refer to FIGURE 2.2 which indicates a cuesta and a hogsback. Match each of the descriptions below with sketches **A** or **B**

FIGURE 2.2: INCLINED STRATA



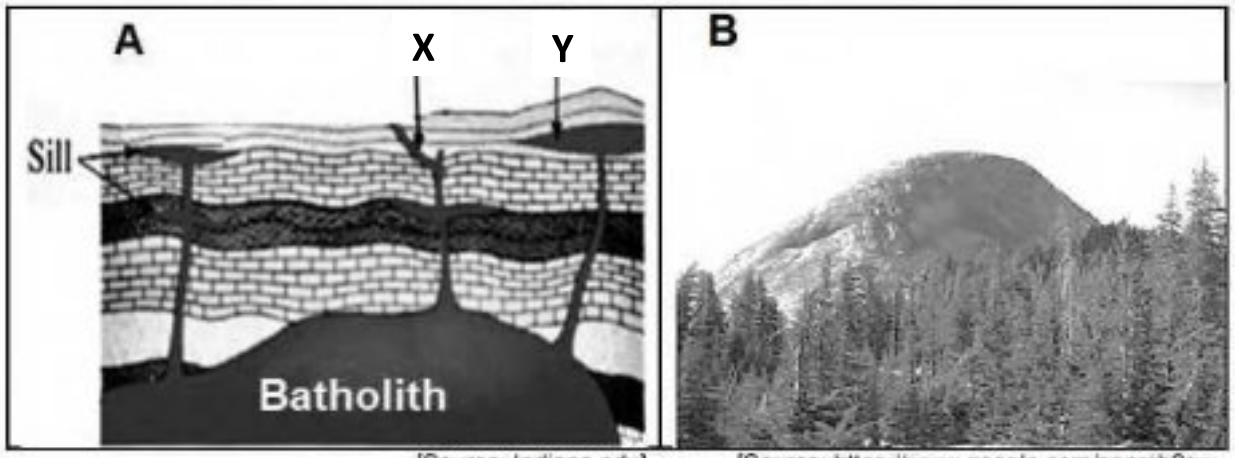
2.2.1 Can form in a dome or basin
2.2.2 Has a steep scarp slope and a gentle dip slope
2.2.3 Scarp slope is more than 45˚
2.2.4. It is a suitable location for dams
2.2.5. The gentle dip slope can be used for farming
2.2.6. Composed of steeply tilted strata of rock
2.2.7. Formed by gently tilted rock strata

(7x1) (7)

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2.3. Study the photos below **A** and **B** showing topography associated with massive igneous rocks.



[Source: Indiana.edu] [Source: https://www.google.com/search?q=DOME+SHAPED+LANDFORMS&rlz=1C1SQJL]

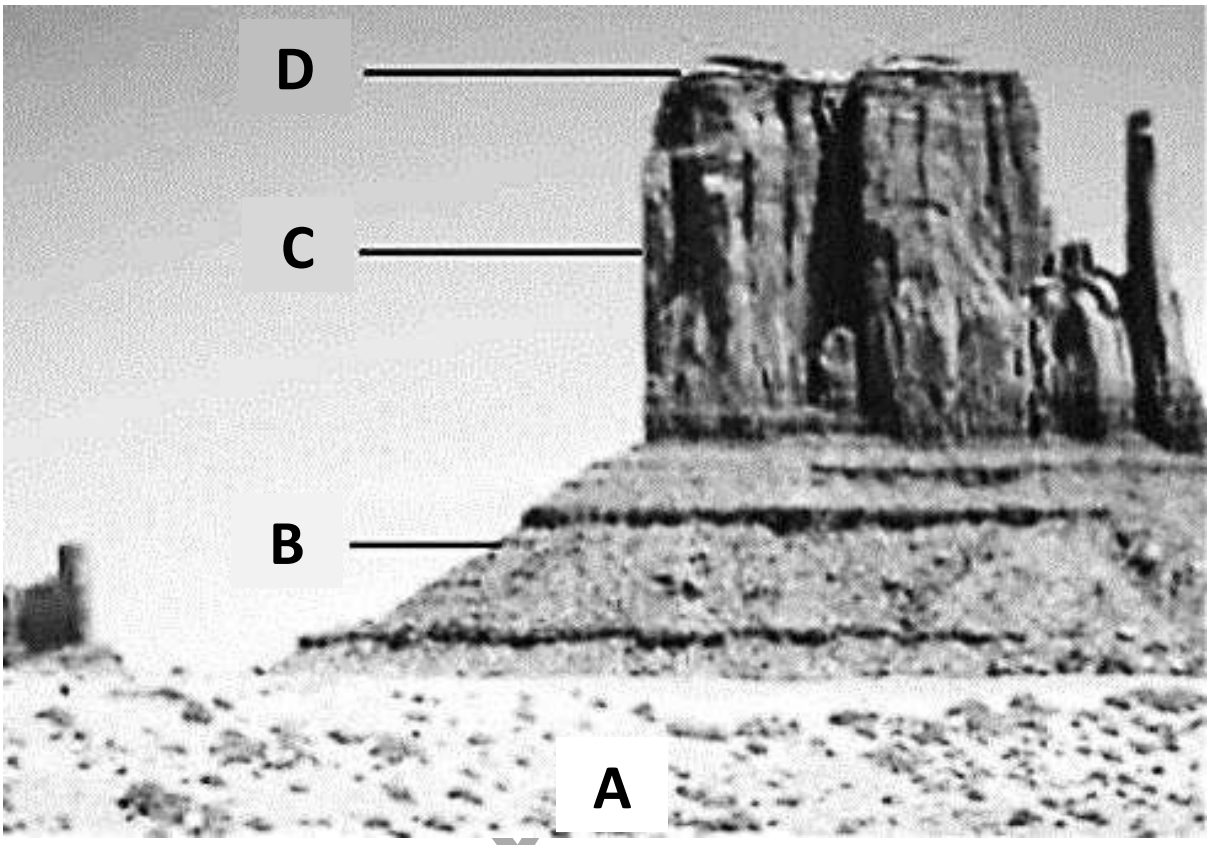
2.3.1. What is the difference between intrusive and extrusive igneous rocks? (2 x 1) (2)
2.3.2. Identify igneous landforms X and Y. (2 x 1) (2)
2.3.3. How does landform X form? (2 x 1) (2)
2.3.4. Name TWO characteristics evident in sketch A that is typical of a batholith. (2 x 1) (2)
2.3.5. Refer to photo B, a dome-shaped landform.
(a) What type of igneous rock is this dome-shaped landform a characteristic of ? (1 x 1) (1)
(b) Is this dome-shaped landform an example of intrusive or extrusive igneous rocks? (1 x 1) (1)
(c) Name the type of weathering that occurs on this dome-shaped landform. (1 x 1) (1)
(d) Explain how this dome-shaped landform has formed. (2 x 2) (4)

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2.4. Refer to FIGURE 2.4 which shows the typical slope elements/forms labelled associated with a slope.

FIGURE 2.4: SLOPES



2.4.1. Identify the slope elements/forms labelled **A, B, C** and **D.** (4x1) (4)
2.4.2. Give ONE characteristic of each of the slope elements/forms labelled **D** and **B** (2x2) (4)
2.4.3. Which slope element is best suited for crop farming? Give a reason for your answer. (1+2) (3)
2.4.4. Slopes provide a valuable piece of land for mankind. Discuss the significance of slopes for human activity. (2x2) (4)

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2.5. Study figure 2.5 below showing mass movement.



2.5.1. Define the concept mass movement. (1x2) (2)
2.5.2. What type of mass movement is illustrated in FIGURE 2.5.? (1x1) (1)
2.5.3. Provide evidence from FIGURE 2.5. that mass movement is taking place. (1x2) (2)
2.5.4. Provide any negative impact of the mass movement indicated in figure 2.5. (1x2) (2)
2.5.5. In paragraph of approximately EIGHT lines, discuss strategies that can be used to minimize, the effects of mass movements. (4x2) (8)
[60]

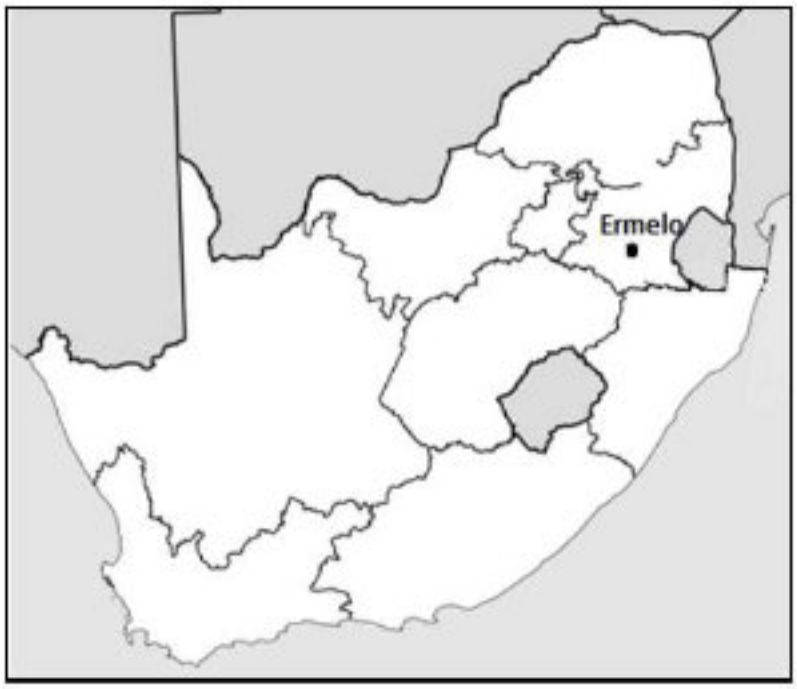
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SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

BACKGROUND INFORMATION ON ERMELO



Co-ordinates: 26°31'S ; 29°58'E

Ermelo is an educational, industrial and commercial town in the 7,750 km^2 Gert Sibande District Municipality in Mpumalanga, South Africa. It is located 210 km east of Johannesburg. It is both a mixed agriculture and mining region. Mixed farming, such as maize and cattle, take place within the district. Mining is important to the district with anthracite, coal and torbanite being mined.

[Source: https://en.wikipedia.org/wiki/Ermelo,_Mpumalanga]

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

ENGLISH	AFRIKAANS
Diggings	Uitgrawings
River	Rivier
Sewerage works	Rioolwerke
Opencast mine	Oopgroefmyn
Prison	Tronk
Purification Plant	Suiweringsaanleg

3.1. MAP SKILLS AND CALCULATION

3.1.1. The contour interval of the Orthophoto map is ……..

A 50 meters

B 20 meters

C 5 meters

D 10 meters (1x1) (1)

3.1.2. The altitude of the trig beacon in block D2 on the topographical map is……

A. 305

B. 350

C. 1736.8

D. 1763.8 (1x1) (1)

3.1.3. Calculate the length of the dam wall in Block C3 in meters. (2x1) (2)

3.1.4. Calculate the vertical exaggeration of the slope on the orthophoto map.

Use the following information:

Vertical scale: 1cm is to 20m

Horizontal scale is shown on the topographical map

Formula VE= $\frac{VS}{HS}$ (5x1) (5)

3.1.5. State the direction of the Opencast Mine at D1 and E1 on the topographical map from Rietspruit in block D2 (1x1) (1)

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3.2. MAP INTERPRETATION

3.2.1. In which province is Ermelo located……

A. Limpopo

B. Gauteng

C. Mpumalanga

D. North west (1x1) (1)

3.2.2.The curved contour lines in (D1, C1 and C2) on the Orthophoto map represent

A. Spur

B. Mountain

C. Valley

D. Excavations (1x1) (1)

3.2.3. Refer to the river in block D3 on the topographic map 2629DB Ermelo and answer questions that follow.

(a) Is the river perennial or non-perennial? (1x1) (1)

(b) Determine the general flow of the river. (1x1) (1)

(c) Provide a reason to support your answer in 3.2.1 (b). (1x2) (2)

3.2.4. Refer to block D1 on the topographic map

(a) Identify the type of slope evident in block D1. (1x1) (1)

(b) Identify the type of mining evident in the block D1. (1x1) (1)

(c) Give two sources of water evident in block D1 that support the farming community (2x1) (2)

3.2.5. Give the specific name of road passing through C2, D2 and D3 on the orthophoto map. (You may also refer to the topographical map) (1x2) (2)

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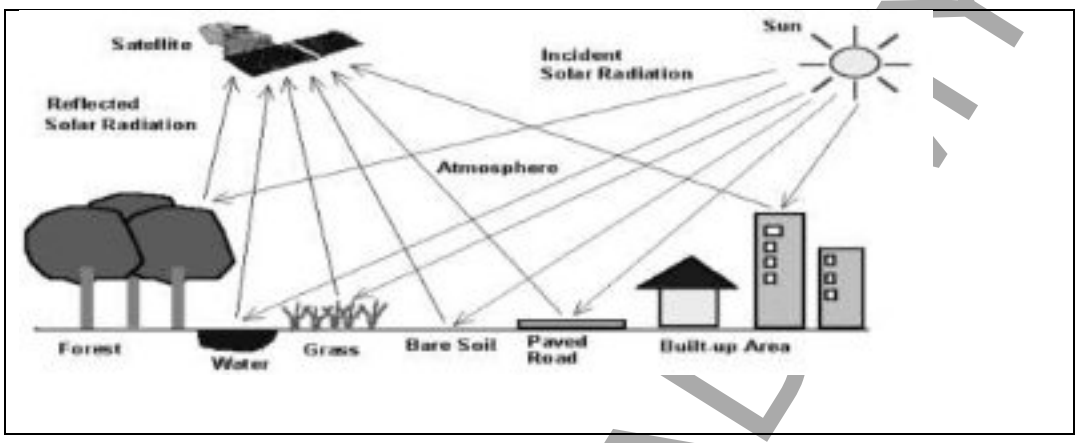
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GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

3.3.1. Is Orthophoto map of Ermelo a vector or Raster map? (1x1) (1)

3.3.2. Give a reason to support your answer to QUESTION 3.3.1. (1x2) (2)

3.3.3. Refer to the photograph below about remote sensing.



(a) Define the concept remote sensing. (1 x 2) (2)

(b) State one advantage of remote sensing (1 x 1) (1)

(c) Name two examples of remote sensing (2 x 1) (2)

[30]

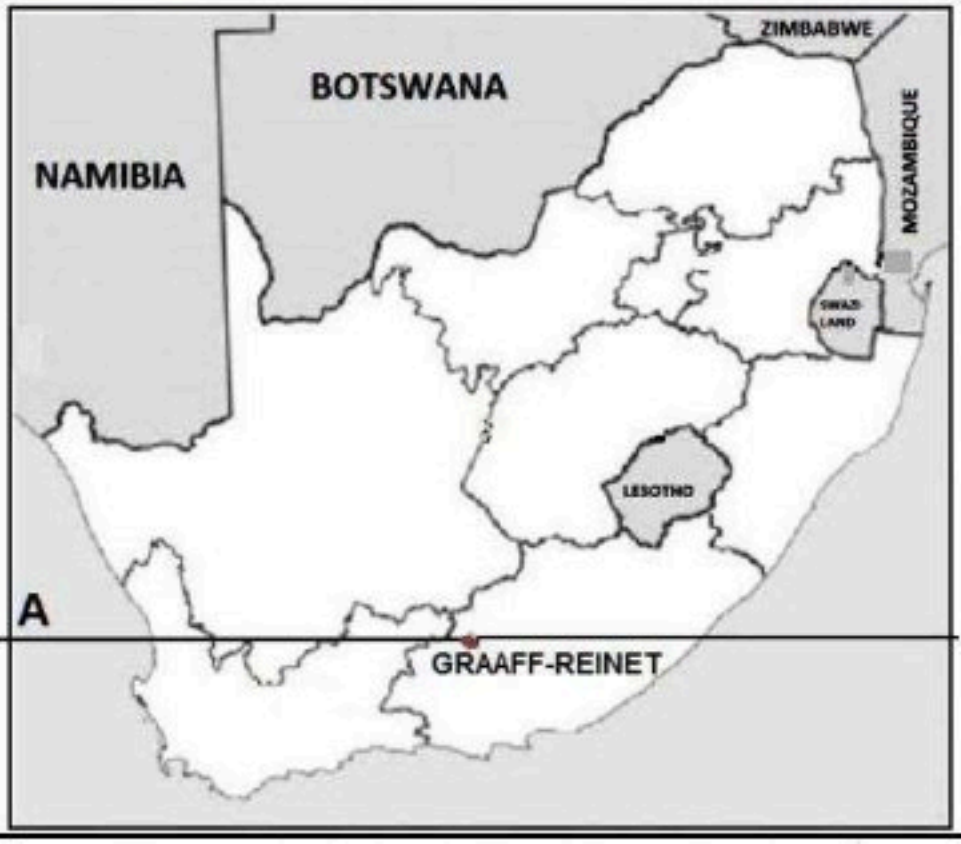
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GENERAL INFORMATION ON GRAAFF-REINET

Set in a curl of the Sundays River, the Karoo town of Graaff-Reinet is the fourth oldest settlement in South Africa and overshadowed by the rocky Sneeuberg Mountain within the Camdeboo National Park. From here, you can also see the Valley of Desolation and get a good sense of the utter vastness of the Great Karoo. Modern Graaff-Reinet is based on tourism, game farming and traditional stock like Merino sheep and 'white gold': angora goats, which give mohair.



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QUESTION 3: GEOGRAPHIC SKILLS AND TECHNIQUES

3.1 MAP SKILLS AND CALCULATION

Study the topographic and orthophoto map and answer questions that follow

3.1.1. The contour interval in block C1 on the Orthophoto map is …. (1x1) (1)

A. 50 meters

B. 20 meters

C. 5 meters

D. 10 meters

3.1.2. The altitude of the trig beacon found in block C9 on the topographical map is ……

A. 89

B. 98

C. 1066.7

D. 1077.6 (1x1) (1)

3.1.3. Calculate the length of the dam wall in Block K8 and K9. Give your answers in meters. (2x1) (2)

3.1.4. (a) Calculate the vertical exaggeration of the slope on the orthophoto map.

Use the following information:

Vertical scale: 1cm is to 20m

The Horizontal scale is shown on the topographical map

Formula VE= $\frac{VS}{HS}$ (5x1) (5)

3.1.5. State the direction of Excavation at H7 on the topographical map from Edenvale in Block H9. (1x1) (1)

(10)

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3.2. MAP INTERPRETATION

3.2.1. In which province is Graaf-Reinet found

A. Limpopo

B. Mpumalanga

C. Eastern cape

D. Western Cape (1x1) (1)

3.2.2. The curved contour lines in (E2 to D2) on the Orthophoto map represent

A. Spur

B. Mountain

C. Valley

D. Excavations (1x1) (1)

3.2.3. Refer to the river in block K9 on the topographic map 3224 Graaf-Reinet (south) and answer questions that follow.

(a) Is the river perennial or non-perennial? (1x1) (1)

(b) Determine the general flow of the river. (1x1) (1)

(c) Provide the reason to support your answer in 3.2.1 (b). (1x2) (2)

3.2.4. Refer to the topographic map to answer the following questions:

(a) Identify the type of slope represent by Letter B in block E3 on the topographic map. (1x1) (1)

(b) Identify the feature labelled A in block H7 and H8. (1x1) (1)

(c) Give two sources of water evident in block K7and 8 that support the farming community. (2x1) (2)

3.2.5. Give the specific name of road passing through B5 up to C5 on the Orthophoto map. (1x2) (2)

(12)

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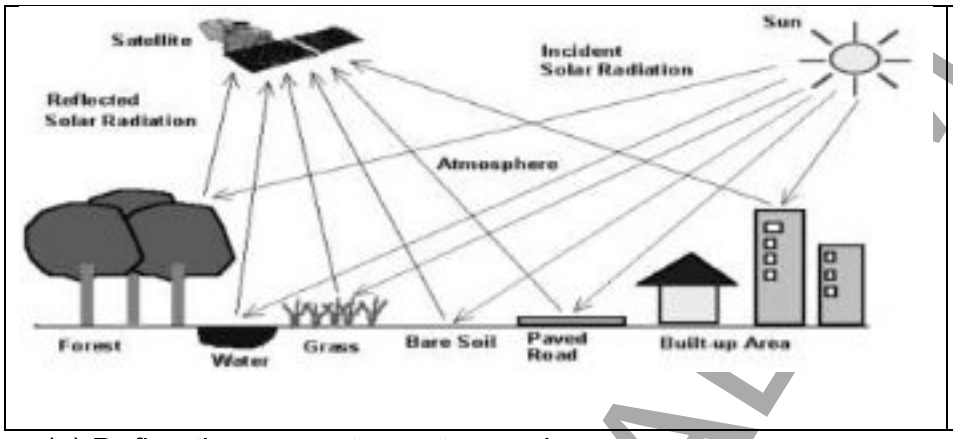
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3.3. GEOGRAPHICAL INFORMATION SYSTEMS

3.3.1. Is Orthophoto map of Graaf-Reinet a vector or Raster map? (1 x 1) (1)

3.3.2. Give a reason to support your answer to QUESTION 3.3.1. (1 x 2) (2)

3.3.3. Refer to the photograph below about remote sensing.



(a) Define the concept remote sensing. (1 x 2) (2)

(b) State one advantage of remote sensing (1 x1) (1)

(c) Name two examples of remote sensing (2 x 1) (2)

(8)

[30]

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