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KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12



GEOGRAPHY P1 (THEORY)

COMMON TEST

MARCH 2021

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MARKS: 60

TIME: 1 hour

This question paper consists of 9 pages and an Annexure of 4 pages.

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INSTRUCTIONS

1. The paper consists of **THREE** QUESTIONS:

   QUESTION 1: CLIMATE AND WEATHER

   QUESTION 2: GEOMORPHOLOGY

   QUESTION 3: MAPWORK

2. ALL diagrams are included in the **Annexure**.

3. The TOPOGRAPHICAL MAP for Question THREE is 2527 RUSTENBURG (WEST) and the ORTHPHOTO MAP is 2527 CA 15 TLHABANE

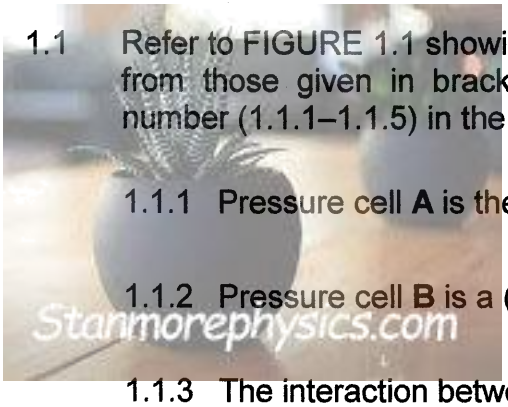
4. Answer **ALL** questions.

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QUESTION 1: CLIMATE AND WEATHER


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1.1 Refer to FIGURE 1.1 showing a synoptic map. Choose the correct word(s) from those given in brackets. Write only the word(s) next to the question number (1.1.1–1.1.5) in the ANSWER BOOK.

1.1.1 Pressure cell **A** is the (Kalahari/South Atlantic) high-pressure cell.

1.1.2 Pressure cell **B** is a (thermal/coastal) low-pressure cell.

1.1.3 The interaction between pressure cells **A** and **B** results in (berg wind/sea breeze).

1.1.4 The cloud cover at Durban will be (overcast/clear) due to the wind identified in QUESTION 1.1.3.

1.1.5 The general direction of movement of the frontal depression is (eastwards/ westwards). (5 x 1) (5)

1.2 Refer to FIGURE 1.2 on tropical cyclone Eloise.

1.2.1 What do you understand by the term *category 2 tropical cyclone*? (1 x 1) (1)

1.2.2 How many tropical cyclones occurred before tropical cyclone Eloise? Give a reason for your answer. (1 + 1) (2)

1.2.3 With reference to FIGURE 1.2, state ONE piece of evidence for the development of tropical cyclone Eloise on 16 January. (1 x 1) (1)

1.2.4 Explain the possible sequence of events that led to tropical cyclone Eloise increasing its intensity from a category 1 equivalent cyclone on 21 January to a category 2 equivalent cyclone on 23 January. (2 x 2) (4)

1.2.5 Suggest how satellite tracking of tropical cyclones can be effective in reducing the loss of lives in numerous countries. (2 x 2) (4)

1.2.6 Write a paragraph of approximately EIGHT lines outlining the possible economic and environmental impact of cyclones such as the one illustrated in FIGURE 1.2. (4 x 2) (8)

[25]

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QUESTION 2: GEOMORPHOLOGY

2.1 Refer to FIGURE 2.1 which shows stream piracy. Match each of the geomorphological descriptions below with the letters A – E. Write only the letter (A - E) next to the question number (2.1.1 – 2.1.5) in the ANSWER BOOK, for example 2.1.6 F.

2.1.1 High lying area that separates two river systems.

2.1.2 The point at which river capture took place.

2.1.3 The stream that has been rejuvenated after river capture had taken place.

2.1.4 The area of gravel where the misfit stream starts to dry up.

2.1.5 The river that has lost its headwaters as a result of river capture. (5 x 1) (5)

2.2 Refer to FIGURE 2.2 showing a drainage basin.

2.2.1 Determine the stream order at **X.** (1 x 1) (1)

2.2.2 What does the drainage pattern suggest about the underlying rock structure of the drainage basin illustrated? (1 x 1) (1)

2.2.3 Give evidence from the diagram that indicates the river has a low drainage density. (1 x 2) (2)

2.2.4 Explain why there are large amounts of material deposited at the mouth of the river. (2 x 2) (4)

2.2.5 Assess the role played by the vegetation in stream discharge. (2 x 2) (4)

2.2.6 In a paragraph of approximately EIGHT lines explain why it is important to manage drainage basins and catchment areas. (4 x 2) (8)

[25]

TOTAL MARKS: [50]

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GEOGRAPHY P1 (MAPWORK) – QUESTION 3

COMMON TEST

MARCH 2021

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GRADE 12

MARKS: 10

NAME: _____

DIVISION: _____

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RESOURCE MATERIAL

1. An extract from topographic map (2527CA RUSTENBURG (WEST)
2. Orthophoto map (2527 CA 15 TLHABANE)
3. **NOTE:** The resource material must be collected by schools for their own use.

INSTRUCTIONS AND INFORMATION

1. Write your NAME and DIVISION in the spaces on the cover page.
2. Answer ALL the questions in the spaces provided in this question paper.
3. You are provided with a 1:50 000 topographic map (2527CA RUSTENBURG (WEST) and an orthophoto map (2527 CA 15 TLHABANE) of a part of the mapped area.
4. You must hand the topographic map and the orthophoto map to the invigilator at the end of this examination session.
5. You may use the blank page at the back of this question paper for all rough work and calculations. Do NOT detach this page from the question paper.
6. Show ALL calculations and formulae, where applicable. Marks will be allocated for these.
7. Indicate the unit of measurement in the final answer of calculations.
8. You may use a non-programmable calculator.
9. The following English terms and their Afrikaans translations are shown on the topographical map:

ENGLISH	AFRIKAANS
Aerodome	Vliegveld
Caravan Park	Karavaanpark
Diggings	Uitgrawings
Golf Course	Gholfbaan
Gap	Poort
Holiday Resort	Vakansieoord
Island	Eiland
Purification Plant	Watersuiweringsaanleg
River	Rivier
Sewage Works	Rioolwerke

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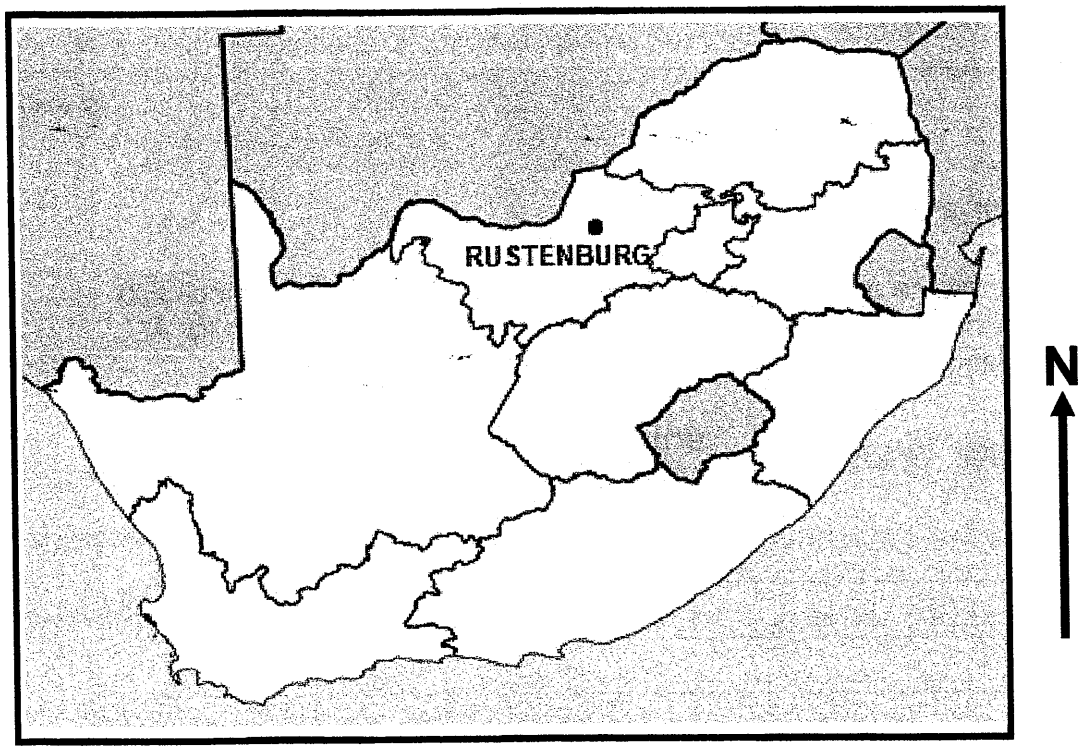
GENERAL INFORMATION OF RUSTENBURG

Rustenburg was established in 1851 as a central place town to support a fertile farming area producing citrus fruit, tobacco, peanuts, sunflower seeds, maize, wheat and cattle. The area became a primary agricultural region with vast citrus estates due to the favourable climate.

Rustenburg is home to the two largest platinum mines in the world and the world's largest platinum refinery, which processes around 70% of the world's platinum.

Lately, the vast citrus estates in the region have been in constant decline due to pollution from increased smelting and beneficiating processes by the mines.
(Beneficiation is when value is added to the raw materials.)

Rustenburg has a temperate climate, it has very warm summers and mild winters. Due to the altitude, summers are not quite as hot as one might expect. Precipitation occurs mainly in summer.



[Source: http://en.wikipedia.org/wiki/rustenburg]

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QUESTION 3: MULTIPLE-CHOICE QUESTIONS

3.1 The questions below are based on the 1:50 000 topographic map (2527 CA RUSTENBURG WEST) as well as the orthophoto map (2527 CA 15 TLHABANE) as part of the mapped area. Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A–D) in the block next to each question.

3.1.1 The slope to the west of spot height 1554 in block **E2** to the contour line 1180 in block **E1** on the topographical map is ...

A uniform.
B concave.
C convex.
D stepped.

3.1.2 The ... in block **G2** indicates that the farmer is using ground water.

A reservoir
B river
C windpump
D dam

(2 x 1) **[2]**

3.2 MAP CALCULATIONS

3.2.1 Calculate the average gradient between spot height 1554 (block **E2**) and spot height 1421 (block **F2**) on the topographic map. Show ALL calculations. Marks will be awarded for calculations.

Formula: $\textbf{Gradient} = \frac{\textbf{vertical interval (VI)}}{\textbf{horizontal equivalent (HE)}}$

(5 x 1) **[5]**

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3.3 GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

3.3.1 Define the term *raster data*. (1 x1) (1)

_____

_____

3.3.2 State TWO ways in which a photo with a high resolution will be of greater assistance to a map reader.

_____

_____

_____

_____

(2 x1) (2)
[10]

TOTAL MARKS: [50]

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GEOGRAPHY P1 (THEORY)

ANNEXURE

COMMON TEST

MARCH 2021

NATIONAL SENIOR CERTIFICATE

GRADE 12

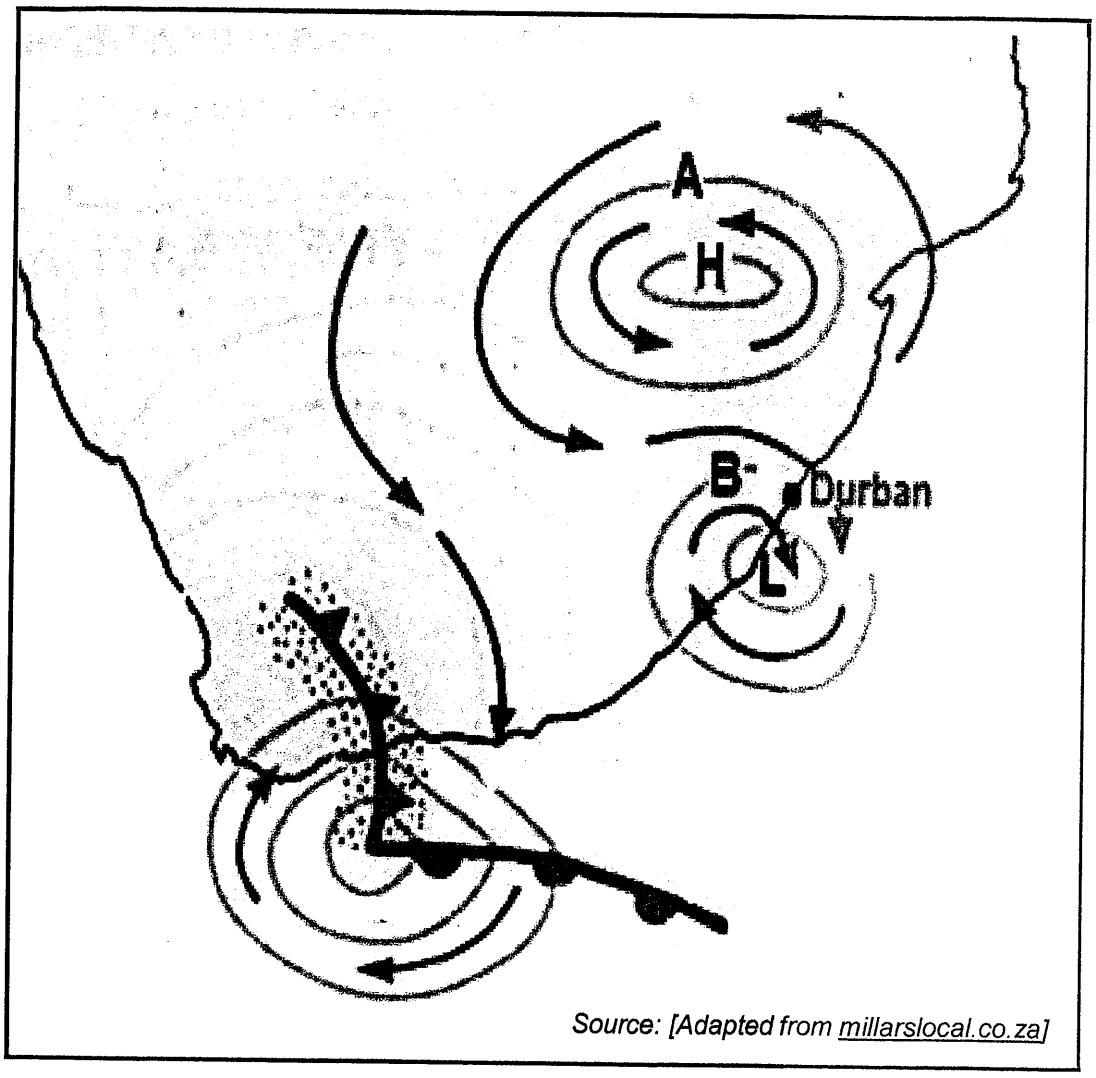
MARKS: 60

TIME: 1 hour

This Annexure consists of 4 pages.

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FIGURE 1.1: SYNOPTIC MAP

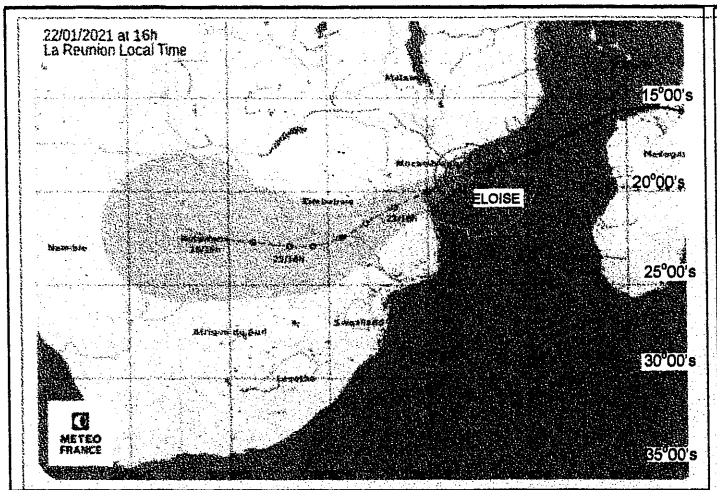


Source: [Adapted from millarslocal.co.za]

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FIGURE 1.2: TROPICAL CYCLONE ELOISE





Eloise nearing landfall in Mozambique at peak intensity on 22 January2021

Formed	14 January 2021
Dissipated	25 January 2021
Highest winds	10-minute sustained: 150 km/h (90 mph) 1-minute sustained: 170 km/h (105 mph)
Lowest pressure	967 hPa (mbar); 28.56 inHg
Fatalities	27 confirmed, 11 missing
Damage	> $10 million (2021 USD)
Areas affected	Madagascar, Mozambique, Malawi, Zimbabwe, South Africa, Eswatini

Part of the **2020–21 South-West Indian Ocean**

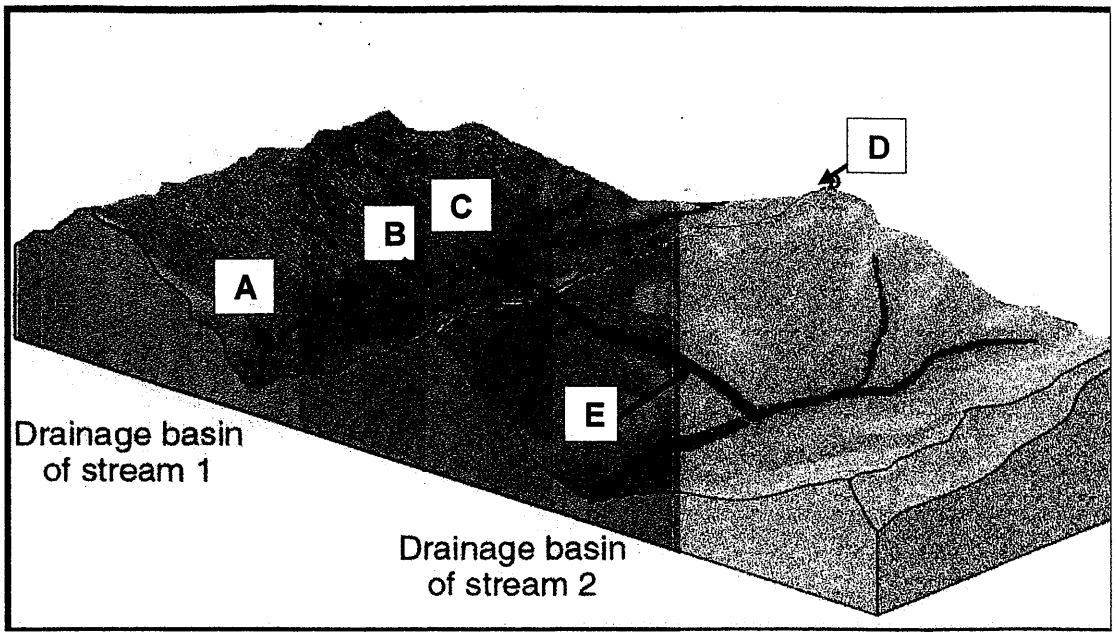
Tropical Cyclone Eloise was the strongest tropical cyclone to impact the country of Mozambique since Cyclone Kenneth in 2019. Eloise's origins can be traced to a disturbance over the central portion of the South-West Indian Ocean basin which developed into a tropical depression on 16 January, and strengthened into a tropical storm on 17 January, though the storm had limited strength and organization. On the next day, the storm entered a more favorable environment, and it soon intensified to a severe tropical storm on 18 January. Late on 19 January, Eloise made landfall in northern Madagascar as a moderate tropical storm, bringing with it heavy rainfall and flooding. The storm traversed Madagascar and entered the Mozambique Channel in the early hours of 21 January. After moving southwestward across the Mozambique Channel for an additional 2 days, Eloise strengthened into a Category 1-equivalent cyclone, due to low wind shear and high sea surface temperatures. Early on 23 January, Eloise peaked as a Category 2-equivalent tropical cyclone on the Saffir-Simpson scale, as the centre of the storm began to move ashore on Mozambique. Shortly afterward, Eloise made landfall just north of Beira, Mozambique with wind speeds in excess of 105mph (170 km/h), uprooting trees, breaking windows, snapping power lines and causing extensive flooding. As the storm moved further inland, Eloise weakened rapidly, due to interaction with the rugged terrain and dry air. Later that day, Eloise weakened into a tropical depression. Subsequently, Eloise weakened into a remnant low over land on 25 January, dissipating soon afterwards.

Source: https://en.wikipedia.org/wiki/Cyclone_Eloise

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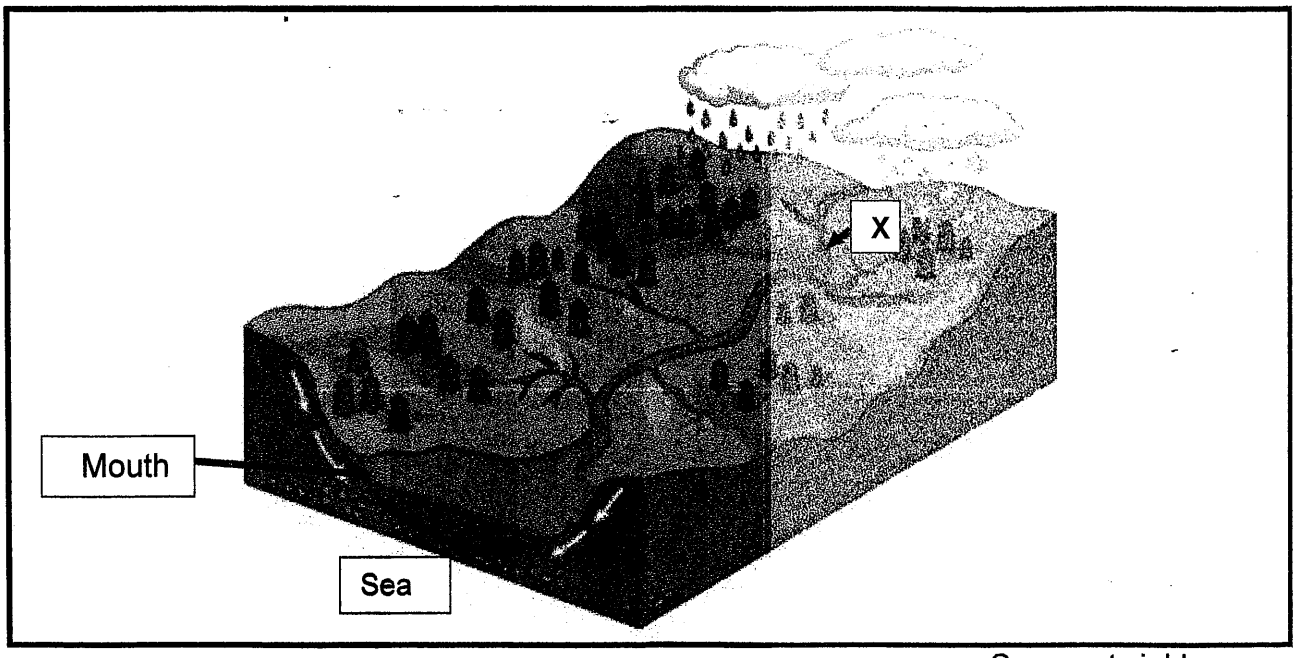
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FIGURE 2.1: STREAM PIRACY



Source: Adapted from google images

FIGURE 2.2: DRAINGE BASIN



Source: twinkl.com

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GRADE 12

GEOGRAPHY P1

MARKING GUIDELINE

COMMON TEST

MARCH 2021

MARKS: 60

This question marking guideline consists of 6 pages.

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QUESTION 1

1.1.1 kalahari✓ no other name.

1.1.2 coastal✓

1.1.3 berg wind✓

1.1.4 clear✓

1.1.5 eastwards✓ (5 x 1) (1)

1.2.1 Wind speeds in excess of 105mph (170 km/h), uprooting trees, breaking windows, snapping power lines and causing extensive flooding✓ (1 x 1) (1)

1.2.2 4✓Cyclones are named alphabetically in the season of occurrence✓ (1+ 1) (2)

1.2.3 Cyclone originated between 5 - 25 degrees south. ✓
Eloise's origins can be traced to a disturbance over the central portion of the South-West Indian Ocean basin✓
(Any One) (1 x 1) (1)

1.2.4 Cyclone tracked for a long period of time in the warm waters of the Mozambique channel that was ideal for promoting high rate of evaporation✓✓
Friction over the large sea track was minimum, assisting rising air (convection) ✓✓
The water vapour content over the ocean is greater, containing latent heat and this formed the trigger for the full development of the cyclone✓✓
(Any TWO) (2 x 2) (4)

1.2.5 Information is received immediately and can be used to warn people ✓✓
Information can be monitored and evacuation plans can be devised, especially for people in low lying areas. ✓✓
Can take images of large inaccessible areas. ✓✓
The intensity of the storm can be monitored ✓✓
Information can be used to determine wind speed, temperature, wind direction ✓✓
Can be used to predict the path ✓✓ (2 x 2) (4)
(Any TWO)

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1.2.6 **NEGATIVE IMPACT ON ECONOMY**

Damage to transport and communication networks ✓✓
Damage to land and property ✓✓
Businesses damaged ✓✓
Financial strain on business, families, people ✓✓
Loss to insurance companies on large claims ✓✓
Loss incurred from damage to farms and livestock ✓✓
Loss to shipping companies, coastal structures
High cost of repairs ✓✓
Insurance claims will increase✓✓
Negative impact on GDP ✓✓
Negative impact on tourism ✓✓
Unemployment resulting from damage to industries/farms/businesses✓✓
Food insecurity resulting from damage to farms✓✓

POSITIVE IMPACT ON ECONOMY

Fills up dams for agricultural/industrial/domestic purposes
Provide moisture for the soil.
Increasing the underground water reserves.

NEGATIVE ENVIRONMENTAL IMPACT

Flooding of low-lying coastal areas ✓✓
Coastal erosion✓✓
Saline intrusion of low-lying coastal land ✓✓
Waterborne diseases ✓✓
Ecosystems are disrupted✓✓
Food chains and food webs will be destroyed ✓✓ (4 x 2) (8)

[25]

(MUST MENTION BOTH ECONOMY AND ENVIRONMENT)

QUESTION 2

You can accept but not include in your memo. / Concept.

2.1.1 D✓ – wetland
2.1.2 C✓ Elbow of capture
2.1.3 E✓ Capture stream
2.1.4 B✓ water gap
2.1.5 A✓ captured stream (5 x 1) (5)

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2.

2.2.1 Stream order 2 ✓ (1 x 1) (1)

Horizontal rock structure.

2.2.2 Uniform horizontal resistance rocks/Homogenous rocks ✓
Sedimentary or igneous rocks ✓ (1 x 1) (1)
(Any ONE)

2.2.3 Very few tributaries✓✓
Few first order streams/fingertip streams ✓✓ (1 x 2) (2)
(Any ONE)

2.2.4 The slope is gentle thus reducing the speed therefore greater deposition✓✓
The valley is wide and shallow – greater deposition ✓✓
There is a reduction in the energy and velocity of the river ✓✓
Stream load exceeds the carrying capacity ✓✓
Limited tidal activity ✓✓
Ocean currents are not able to remove sediments from the mouth ✓✓
The saline condition in the sea causes the sand particles to stick together making the particles larger and heavier at the mouth ✓✓ (2 x 2) (4)
(Any TWO)

2.2.5 The roots will absorb water thus reducing the stream discharge✓✓
Vegetation promote higher infiltration thus decreasing stream discharge ✓✓
Less vegetation will increase stream discharge ✓✓
Less vegetation will promote greater run-off and increase in stream discharge ✓✓ (2 x 2) (4)
(Any TWO)

2.2.6 Water from rivers are essential for life/survival/human health ✓✓
Rivers supply fresh water for domestic and industrial purposes ✓✓
Farming takes place on floodplains and deltas because of the fertile silt that is found here ✓✓
Water from the rivers is used for irrigation purposes ✓✓
Water from the rivers is used to generate hydro-electric power ✓✓
Rivers are used to transport people and goods using boats and barges✓✓
Rivers are used for leisure activities such as fishing, canoeing and white water rafting ✓✓
Rivers are also tourist attraction especially when they have attractive features such as waterfalls and rapids ✓✓
Rivers are a habitat for certain plant and animal species ✓✓
Managing the drainage basin ensures that the ecosystem remains healthy and in a state of balance✓✓
Managing drainage basin and catchment areas assists in flood control especially in low lying areas ✓✓
Managing drainage basins and catchments areas ensure sustainable water usage. ✓✓
(Any FOUR) (4 x 2) (8)

D C E B A

[25]

TOTAL MARKS: 50

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QUESTION 3: MULTIPLE-CHOICE QUESTIONS

3.1 The questions below are based on the 1:50 000 topographical map (2527CA RUSTENBURG WEST) as well as the orthophoto map (2527 CA 15 TLHABANE) as part of the mapped area. Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A–D) in the block next to each question.

3.1.1 The slope to the west of spot height 1554 in block **E2** to the contour line 1180 in block **E1** on the topographical map is …

A uniform.
B concave.
C convex.
D stepped.

B✓

3.1.2 The … in block **G2** indicates that the farmer is using ground water.

A reservoir
B river
C windpump
D dam

C✓

(2 x 1) **[2]**

3.2 MAP CALCULATIONS

3.2.1 Calculate the average gradient between spot height 1554 (block **E2)** and spot height 1421 (block **F2**) the topographical map. Show ALL calculations. Marks will be awarded for calculations.

Formula: $\textbf{Gradient} = \frac{\textbf{vertical interval (VI)}}{\textbf{horizontal equivalent (HE)}}$

Gradient = $\frac{\textbf{VI}}{\textbf{HE}}$

VI = **1554 – 1421 = 133 m** ✓

HE = **2 x 500 = 1000 m** ✓ **(Range: 1.9 – 2.1) (Range: 950 – 1050)**

Gradient = $\frac{133}{1000}$ ✓

= $\frac{1}{7.51}$ ✓

= **1: 7.51** ✓ **(Range: 1: 7,14 – 1: 7,89)** (5 x 1) [5]

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3.3 GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

3.3.1 Define the term *raster data*.

Data of geographical features shown with grid cells/pixels ✓ (Concept) (1 x1) (1)

3.3.2 State TWO ways in which a photo with a high resolution will be of greater assistance to a map reader.

The images will be clearer / sharper ✓
You will be able to see the features in more detail ✓
The shadows created by features will allow you to estimate their height✓
The shadows created by features will assist to estimate the time the photo was taken ✓ (2 x1) (2)
(Any TWO)

[3]

TOTAL MARKS: [10]

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