



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

GEOGRAPHY P1

2023

Stanmorephysics

MARKS: 150

TIME: 3 hours

This question paper consists of 20 pages.



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 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. 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 2526CA ZEERUST and a 1 : 10 000 orthophoto map 2526 CA 2 ZEERUST are provided.
15. The area demarcated in RED/BLACK on the topographic map represents the area covered by the orthophoto map.
16. Marks will be allocated for steps in calculations.
17. You must hand in the topographic map and the orthophoto map to the invigilator at the end of this examination.



1.1.4 The dew point temperature indicated at weather station **B** is ... °C.

- A 4
- B 29
- C 17
- D 28

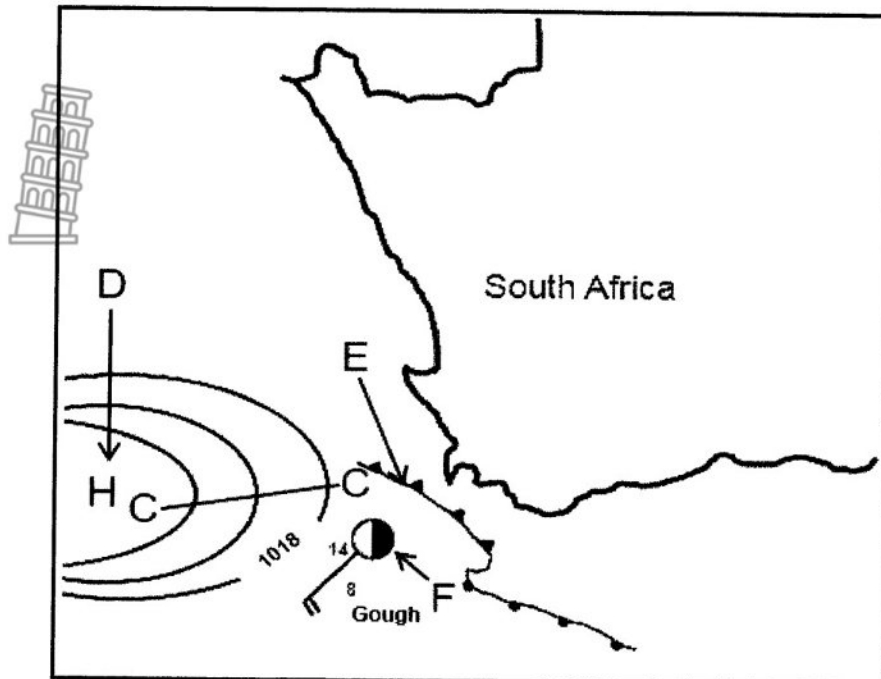
1.1.5 The weather stations around the interior high-pressure cell show clear skies due to ... air, and the anticlockwise circulation results in ... winds.

- (i) subsiding
- (ii) rising
- (iii) south-easterly
- (iv) north-westerly

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



Refer to the map below to answer QUESTIONS 1.1.6 to 1.1.8.



[Source: Examiner's own sketch]

1.1.6 Line C-C represents a ...

- A ridge.
- B saddle.
- C trough.
- D depression.

1.1.7 The high-pressure cell at D will cause weather system E to move in a ... direction.

- A south-easterly
- B north-easterly
- C south-westerly
- D north-westerly

1.1.8 The weather conditions at weather station F:

- (i) Air temperature is 8 °C
- (ii) Cloud cover is 4/8
- (iii) South-westerly wind
- (iv) Wind speed is 5 knots

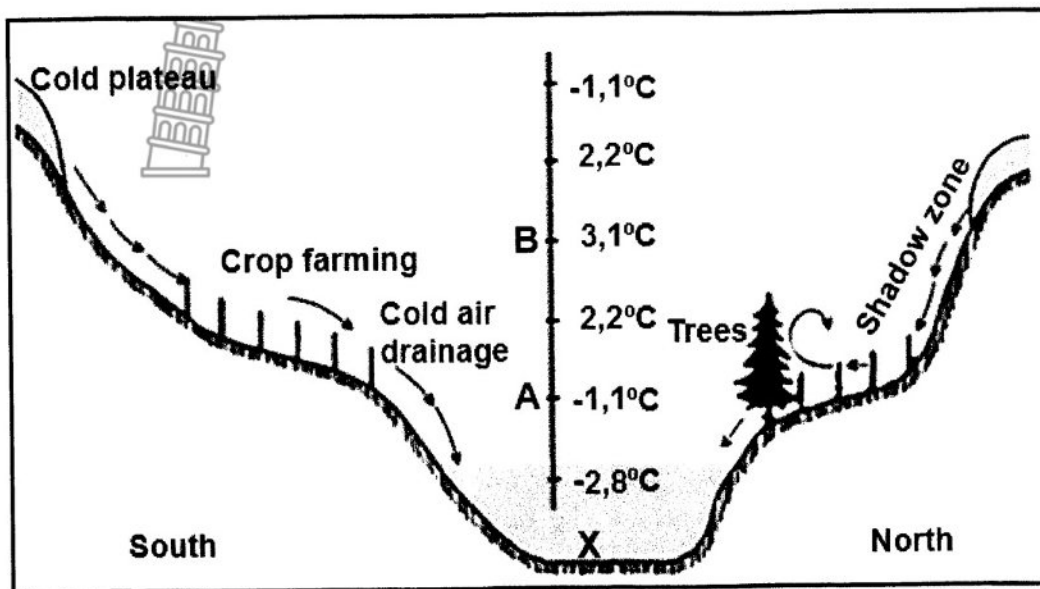
- A (i) and (ii)
- B (ii) and (iii)
- C (i) and (iv)
- D (ii) and (iv)



(8 x 1) (8)



1.2 Refer to the sketch below showing valley climates. Complete the statements in COLUMN A with the options in COLUMN B. Write down only Y or Z next to the question numbers (1.2.1 to 1.2.7) in the ANSWER BOOK, e.g. 1.2.8 Y.



[Adapted from <https://journals.ashs.org/hortsci/view/journals/hortsci/43/6/article-p1652.xml>]

COLUMN A		COLUMN B	
1.2.1	The direction in which the slope faces in relation to insolation is ...	Y	orientation
		Z	aspect
1.2.2	The sketch represents a valley in the ... Hemisphere.	Y	Southern
		Z	Northern
1.2.3	... wind occurs due to terrestrial radiation.	Y	Katabatic
		Z	Anabatic
1.2.4	A temperature inversion occurs between A and B due to a/an ... in temperature with height.	Y	decrease
		Z	increase
1.2.5	The form of precipitation that could occur at X is ...	Y	dew
		Z	frost
1.2.6	... fog may form in the valley on clear, calm nights.	Y	Radiation
		Z	Advection
1.2.7	The northern side of the valley is covered by trees because of ... evaporation.	Y	high
		Z	low

(7 x 1) (7)



1.3 Refer to the extract below on cold fronts.

**TWO COLD FRONTS TO HIT WESTERN CAPE THIS WEEKEND –
'HEAVY RAINFALL' TO FOLLOW**

Date: 10 June 2022

According to the South African Weather Service (SAWS), two cold fronts are expected to bring rain, strong winds, high waves and a significant drop in temperatures to South Africa.

The first cold front is expected to hit the Western Cape on Sunday evening 12 June. Ahead of this first cold front, strong north-westerly to westerly winds between 50–60 km/h, gusting up to 70–80 km/h, are expected over the southern parts of the Northern Cape and the interior of the Western and Eastern Cape from Sunday.

The second cold front is expected to reach the Western Cape by Monday evening 13 June, bringing continued high amounts of rainfall mainly to the south-western parts of the Western Cape, especially from Monday to Wednesday afternoon.

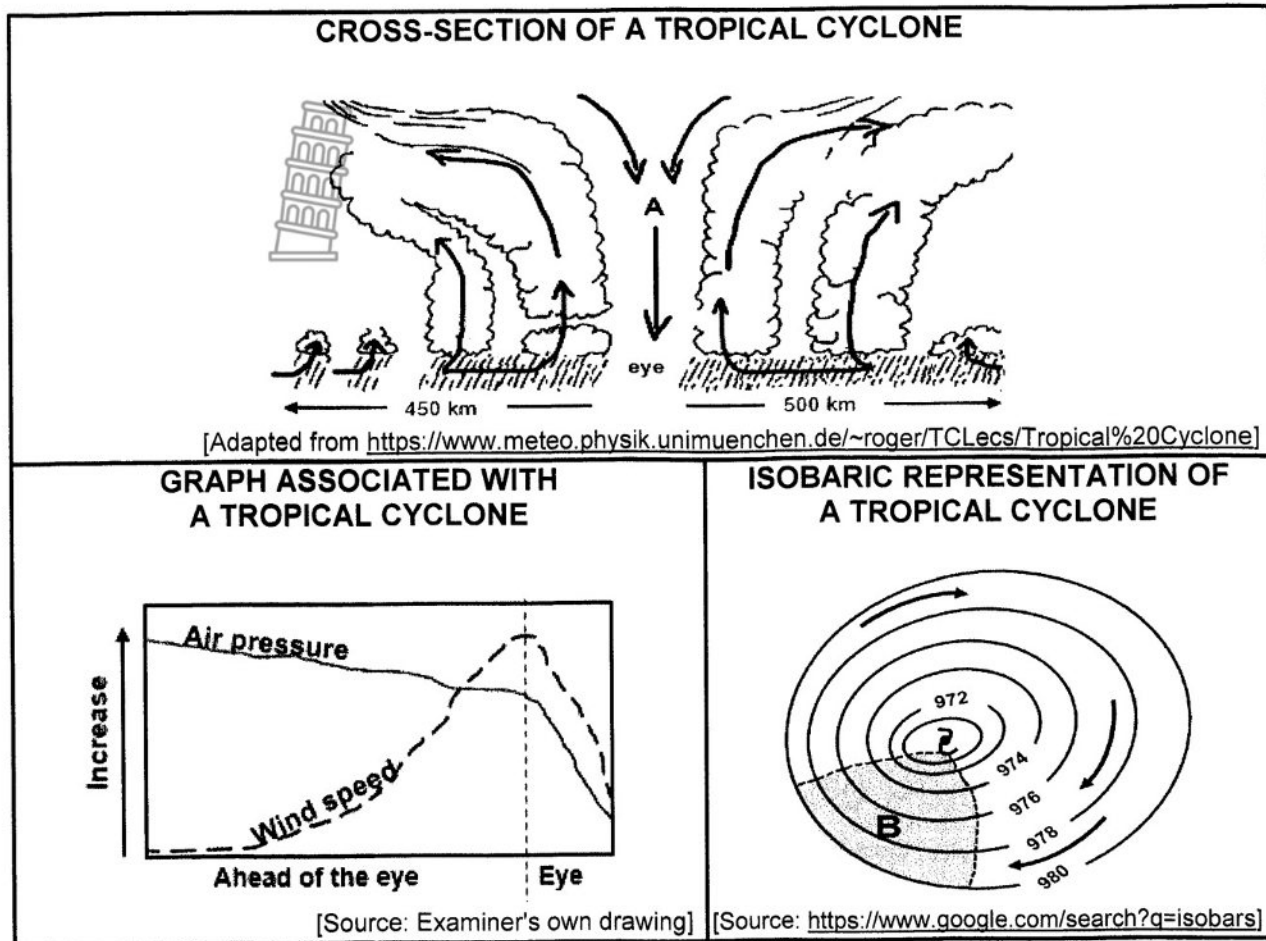
The wind direction associated with the cold front will change from north-west to south-west as the front moves over the Western Cape.

[Adapted from [http://www.First cold front to hit Western Cape this weekend – 'heavy rainfall' to follow \(thesouthafrican.com\)](http://www.First cold front to hit Western Cape this weekend – 'heavy rainfall' to follow (thesouthafrican.com))]

- 1.3.1 In which season do the cold fronts mentioned in the extract influence the Western Cape? (1 x 1) (1)
- 1.3.2 Give evidence from the extract to support your answer to QUESTION 1.3.1. (1 x 1) (1)
- 1.3.3 Why do cold fronts have a greater impact on the Western Cape during this season (answer to QUESTION 1.3.1)? (1 x 2) (2)
- 1.3.4 The change in wind direction mentioned in the extract is known as (veering/backing) in the Southern Hemisphere. (1 x 1) (1)
- 1.3.5 Give a reason from the extract for your answer to QUESTION 1.3.4. (1 x 2) (2)
- 1.3.6 In a paragraph of approximately EIGHT lines, suggest positive and negative impacts of heavy rainfall associated with the cold fronts on the physical (natural) environment of the Western Cape. (4 x 2) (8)



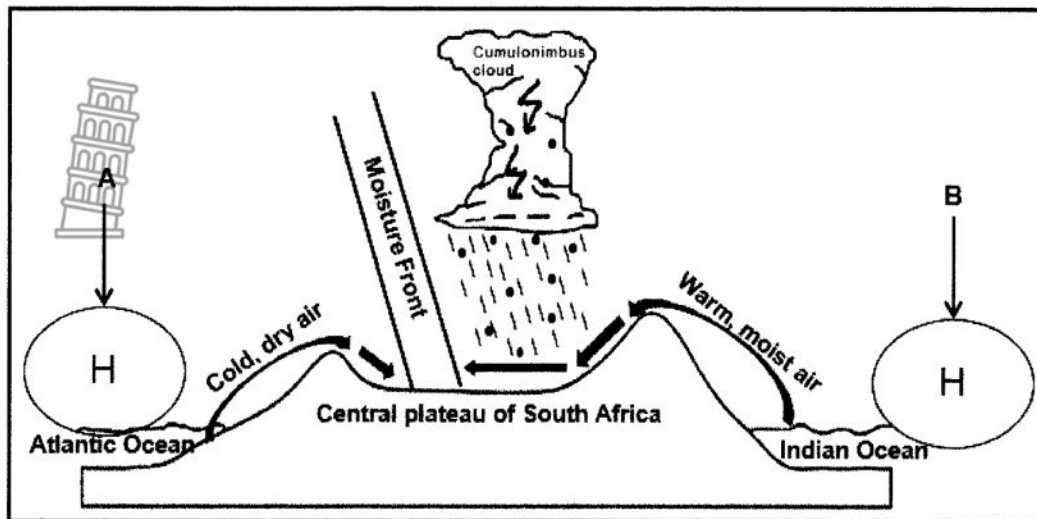
1.4 Refer to the infographic below on tropical cyclones.



- 1.4.1 What evidence indicates that the tropical cyclone developed in the Southern Hemisphere? (1 x 1) (1)
- 1.4.2 Give TWO reasons from the infographic to indicate that the tropical cyclone is in its mature stage. (2 x 1) (2)
- 1.4.3 How will the descending air at **A** influence the cloud cover in the eye? (1 x 2) (2)
- 1.4.4 Give a reason for your answer to QUESTION 1.4.3. (1 x 2) (2)
- 1.4.5 What is the relationship between the wind speed and air pressure as indicated on the graph?
 - (a) Ahead of the eye (1 x 2) (2)
 - (b) Within the eye (1 x 2) (2)
- 1.4.6 Why is area **B** on the sketch of the isobaric representation referred to as the leading left quadrant (dangerous semicircle)? (1 x 2) (2)
- 1.4.7 How does the leading left quadrant (dangerous semicircle) develop in tropical cyclones? (1 x 2) (2)



1.5 Refer to the sketch below on line thunderstorms.



[Source: Examiner's own sketch]

- 1.5.1 Identify high-pressure cells **A** and **B**. (2 x 1) (2)
- 1.5.2 Which season is represented by the sketch? (1 x 1) (1)
- 1.5.3 Give **ONE** reason from the sketch for your answer to QUESTION 1.5.2. (1 x 2) (2)
- 1.5.4 What is a *moisture front*? (1 x 2) (2)
- 1.5.5 Name **TWO** forms of precipitation associated with a line thunderstorm. (2 x 1) (2)
- 1.5.6 Describe the processes involved in the formation of line thunderstorms. (3 x 2) (6)

[60]



QUESTION 2: GEOMORPHOLOGY

2.1 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 (2.1.1 to 2.1.8) in the ANSWER BOOK, e.g. 2.1.9 D.

2.1.1 A river and its tributaries is known as a ...

- A catchment.
- B drainage basin.
- C river system.
- D surface run-off.

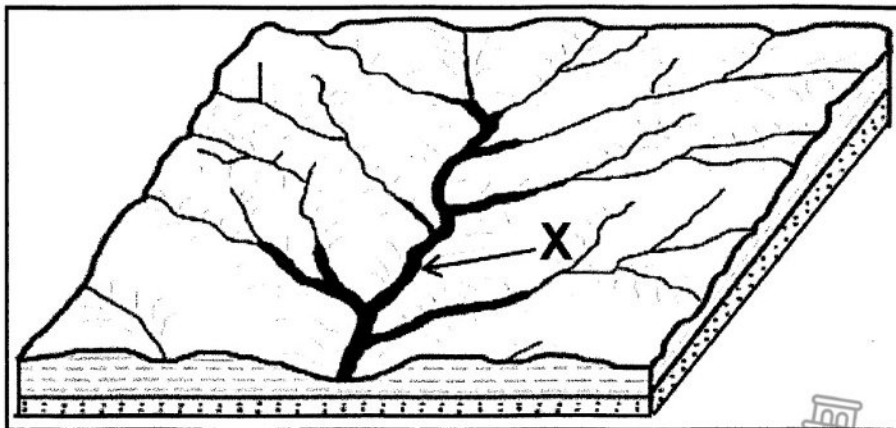
2.1.2 The high-lying area separating two drainage basins is a/an ...

- A watershed.
- B interfluve.
- C water table.
- D source.

2.1.3 Where two or more rivers join it is known as a/an ...

- A interfluve.
- B tributary.
- C main stream.
- D confluence.

Refer to the sketch below of the drainage basin to answer QUESTIONS 2.1.4 to 2.1.6.



[Source: Examiner's own sketch]

2.1.4 The sketch above represents a ... drainage pattern.

- A rectangular
- B dendritic
- C radial
- D parallel



2.1.5 The stream order at X is ... order.

- A 1st
- B 2nd
- C 3rd
- D 4th

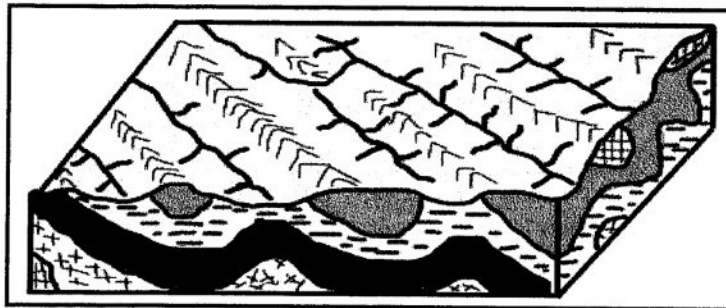


2.1.6 The drainage density of the drainage basin is high because it is influenced by the river flowing in areas of ... and ...

- (i) less vegetation
- (ii) high porosity
- (iii) high rainfall
- (iv) high permeability

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

Refer to the trellis drainage pattern below to answer QUESTIONS 2.1.7 and 2.1.8.



[Source: Examiner's own sketch]

2.1.7 The tributaries of a trellis drainage pattern ...

- A join the main stream at an acute angle.
- B join the main stream at right angles.
- C bends 90° along its course.
- D flows away from a central point.

2.1.8 This drainage pattern is found in regions of ... and ...

- (i) inclined strata
- (ii) jointed igneous rocks
- (iii) uniform resistant rocks
- (iv) folded strata

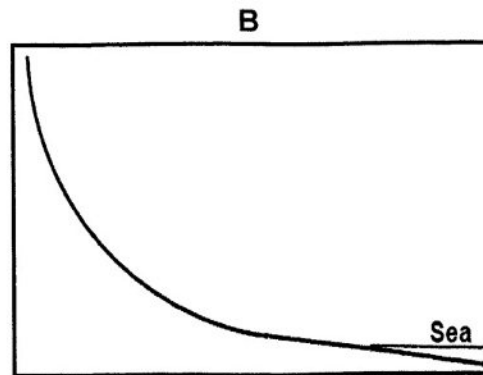
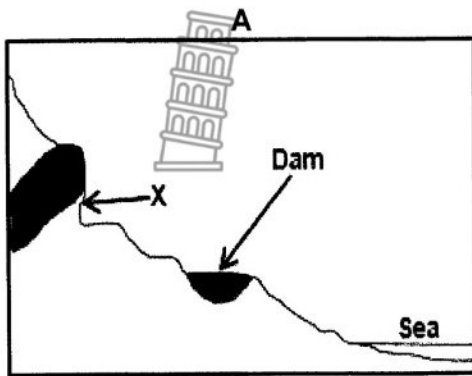


- A (i) and (ii)
- B (iii) and (iv)
- C (i) and (iv)
- D (ii) and (iv)

(8 x 1) (8)



2.2 Refer to river profiles **A** and **B** below. Complete the statements in COLUMN A with the options in COLUMN B. Write down only **Y** or **Z** next to the question numbers (2.2.1 to 2.2.7) in the ANSWER BOOK, e.g. 2.2.8 Y.



[Source: Examiner's own sketch]

COLUMN A		COLUMN B	
2.2.1	Sketches A and B illustrate ... profiles of a river.	Y	cross
		Z	longitudinal
2.2.2	Temporary base levels of erosion are evident in sketch ...	Y	A
		Z	B
2.2.3	The profile of sketch B is ...	Y	graded
		Z	ungraded
2.2.4	The dominant process at X in sketch A is ... erosion.	Y	headward
		Z	lateral
2.2.5	The permanent base level of erosion is the ...	Y	dam
		Z	sea
2.2.6	In profile ..., there is an equilibrium between erosion and deposition.	Y	A
		Z	B
2.2.7	River profile B developed due to ...	Y	erosion of temporary base levels.
		Z	the lowering of the watershed.

(7 x 1) (7)



2.3 Refer to the photograph of a valley below to answer QUESTIONS 2.3.1 and 2.3.2.

VALLEY

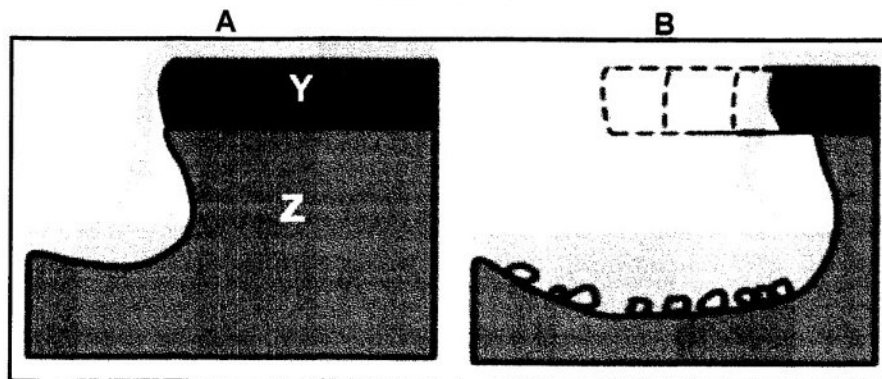


[Source: <https://www.gettyimages.ac/valleys>]

- 2.3.1 The valley in the photograph is generally found in the (upper/middle) course. (1 x 1) (1)
- 2.3.2 Identify TWO characteristics visible in the photograph to support your answer to QUESTION 2.3.1. (2 x 2) (4)

Refer to sketches A and B below of a waterfall to answer QUESTIONS 2.3.3 to 2.3.5.

WATERFALL

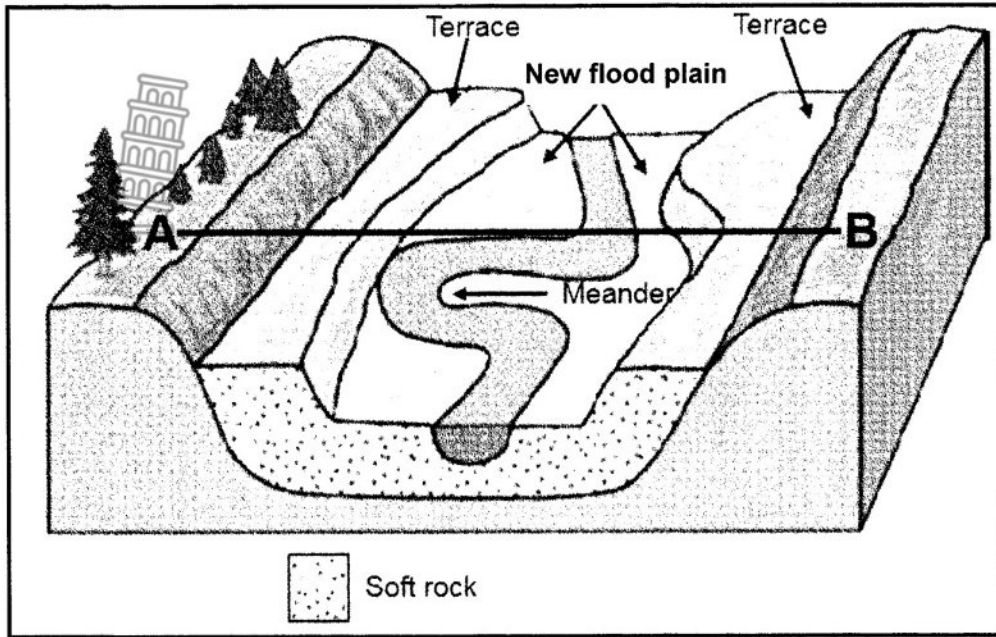


[Adapted from www.internetgeography.net]

- 2.3.3 What is a *waterfall*? (1 x 2) (2)
- 2.3.4 Match Y and Z in sketch A with the concepts resistant (hard) rock and less resistant (soft) rock. (2 x 1) (2)
- 2.3.5 How does erosion in sketch B cause the waterfall to retreat (move) upstream? (3 x 2) (6)



2.4 Refer to the sketch below on river rejuvenation.



[Adapted from www.studyblue.com]

- 2.4.1 What is *river rejuvenation*? (1 x 2) (2)
- 2.4.2 State TWO possible causes of river rejuvenation. (2 x 1) (2)
- 2.4.3 Draw a labelled free-hand cross-section from **A** to **B** of the illustrated river rejuvenation.
- Marks will be allocated for:
- (a) Shape of the rejuvenated valley (1 x 1) (1)
 - (b) Indication of the new flood plain (1 x 1) (1)
 - (c) Indication of terraces (1 x 1) (1)
- 2.4.4 How did the river terraces (illustrated in the sketch) form? (2 x 2) (4)
- 2.4.5 Explain how the illustrated landscape will negatively impact on infrastructure development. (2 x 2) (4)



2.5 Refer to the extract below on catchment and river management.

RIVER TURNS BLACK AFTER COAL MINE DAM COLLAPSES NEXT TO RURAL COMMUNITIES AND HLUHLUWE-IMFOLOZI GAME RESERVE

By Tony Carle, 11 January 2022

Large volumes of potentially toxic coal mine effluent (waste) have spilled into rivers flowing through rural communities and the Hluhluwe-Imfolozi Game Reserve.

According to the US-based Union of Concerned Scientists, mining and coal-washing operations produce high water pollution which can also contain toxic heavy metals such as arsenic copper, lead and manganese.

When the slurry dam* wall collapsed on 24 December, the residents of the affected communities were not warned about the potential hazards until two weeks later. Conservation managers in the neighbouring Hluhluwe-Imfolozi Game Reserve were also led to believe that the spill was under control, only to discover pitch-black water flowing through the reserve several days later.

By this stage, the black water had reached the confluence of the Black and White Imfolozi Rivers.

*slurry dam – a dam that is used to store by-products of mining operations after separating the ore

[Adapted from dailymaverick.co.za]

- 2.5.1 What caused the river to change its colour to black? (1 x 1) (1)
- 2.5.2 State TWO toxic heavy metals in the extract that could be found in polluted mine water. (2 x 1) (2)
- 2.5.3 Quote ONE phrase from the extract that indicates that the mining company did NOT disclose (make known) the pollution of the river. (1 x 2) (2)
- 2.5.4 What could have been the negative economic impact of non-disclosure (answer to QUESTION 2.5.3) on the community? (1 x 2) (2)
- 2.5.5 In a paragraph of approximately EIGHT lines, describe the environmental importance of managing the Imfolozi drainage basin AND suggest measures that the local municipality could implement to maintain the future quality of water. (4 x 2) (8)

[60]

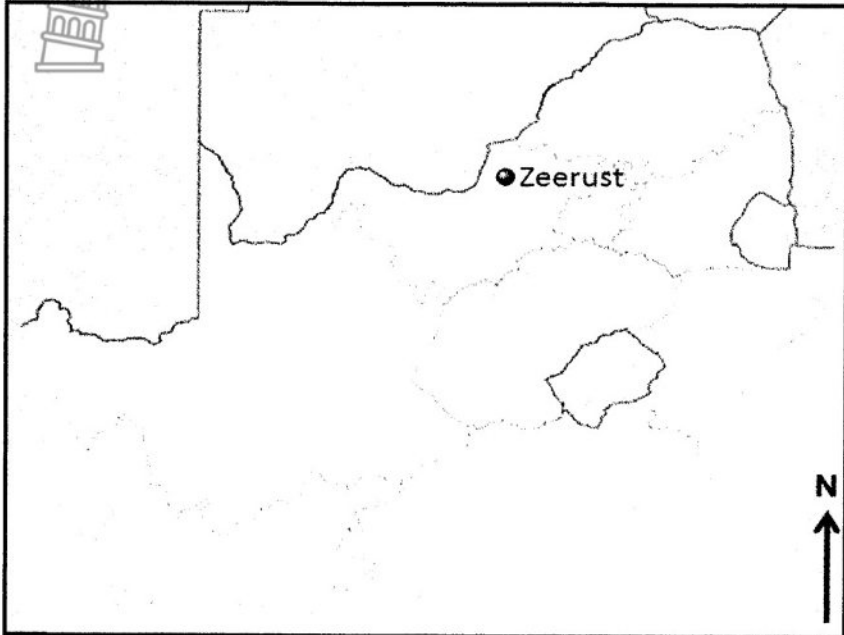
TOTAL SECTION A: 120



SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

GENERAL INFORMATION ON ZEERUST



Coordinates: 25°32'S; 26°05'E

Zeerust is a commercial town situated in the North West. It is situated in the Marico Valley, approximately 1 294 metres above sea level.

The town is 240 kilometres north-west of Johannesburg. It lies along the N4, the main road link between South Africa and Botswana.

The climate in this area is characterised by short cold and dry winters and long warm to hot summers. Rain is frequent during the summer months.

Two rivers flow through Zeerust: the Klein-Marico and the Karee Spruit. In Zeerust, there is a natural spring at the Marico Oog.

[Source: <https://en.wikipedia.org/wiki/Zeerust>]

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

ENGLISH

Grave
River
Rifle Range

AFRIKAANS

Graf
Rivier
Skietbaan



3.1 MAP SKILLS AND CALCULATIONS

3.1.1 The grid reference of spot height 1315 in block **B4** on the topographic map is ...



- A 25°07'07"S; 26°31'26"E.
- B 25°31'26"S; 26°07'07"E.
- C 26°07'07"S; 25°31'26"E.
- D 26°31'07"S; 25°07'26"E.

(1 x 1) (1)

3.1.2 The straight-line distance from **1** in block **A1** to Kopfonteinnek on the orthophoto map is ... kilometres (km).

- A 4,0
- B 0,4
- C 104,0
- D 100,4

(1 x 1) (1)

Refer to the topographic map.

3.1.3 Calculate the average gradient from spot height 1463 at **F** in block **A2** to the benchmark at **G** in block **C2**.

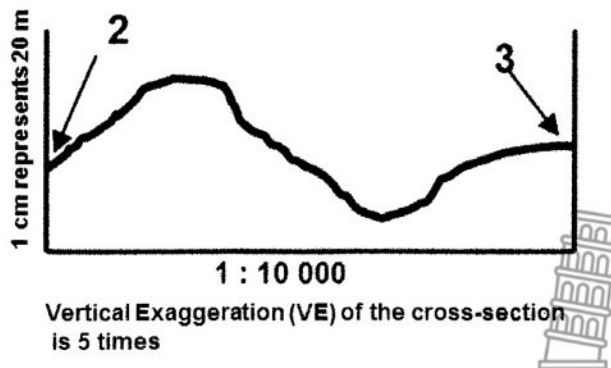
Use the following information:

Horizontal Equivalent (HE) is 3 000 m.

Formula:
$$\frac{\text{Vertical Interval (VI)}}{\text{Horizontal Equivalent (HE)}}$$
 (3 x 1) (3)

3.1.4 Use topographic map evidence and your answer to QUESTION 3.1.3 and give TWO reasons why it will be difficult to construct a road between **F** and **G**. (2 x 1) (2)

Refer to the rough cross-section below, which represents the area from **2** in block **A2** to **3** in block **A3** on the orthophoto map.



3.1.5 (a) Convert the Vertical Scale (VS) on the cross-section to a ratio scale. (2 x 1) (2)

(b) What does the Vertical Exaggeration (VE) of 5 times mean? (1 x 1) (1)



3.2 MAP INTERPRETATION

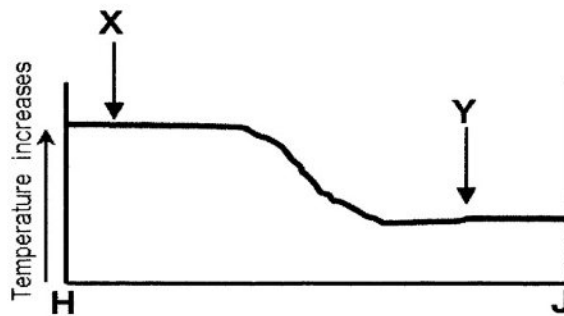
3.2.1 The ... in block E2 on the topographic map is an indication that seasonal rainfall occurs in the area.



- A row of trees
- B perennial river
- C non-perennial river
- D cultivated land

(1 x 1) (1)

Refer to the graph below indicating the average temperature of the area from H in block C1 to J in block C4 on the topographic map.



3.2.2 Identify the human-made feature that was responsible for the higher temperatures recorded at X. (1 x 1) (1)

3.2.3 Explain your answer to QUESTION 3.2.2. (1 x 2) (2)

3.2.4 Identify a natural feature that resulted in lower temperatures at Y. (1 x 1) (1)

3.2.5 Which sketch below represents the slope from 4 in block C1 to 5 in block B1 on the orthophoto map?

<p>A</p>	<p>B</p>
<p>C</p>	<p>D</p>



(1 x 1) (1)



Refer to the orthophoto map.

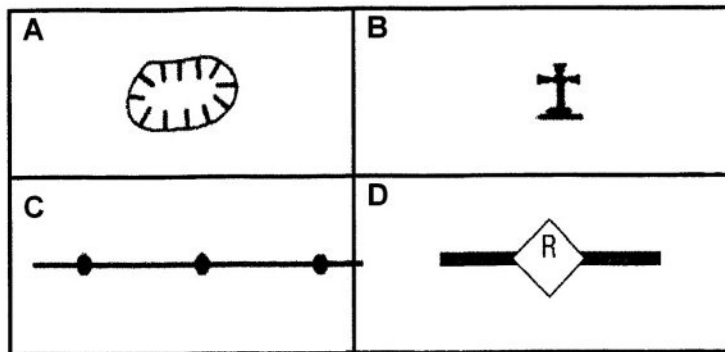
- 3.2.6 How did the topography (relief) of the area favour the location of the rifle range? (1 x 2) (2)

Refer to the topographic map.

- 3.2.7 Describe TWO factors on the topographic map that limited pollution of the Klein-Maricopoort Dam. (2 x 2) (4)

3.3 **GEOGRAPHIC INFORMATION SYSTEMS (GIS)**

- 3.3.1 Which ONE of the following is a standardised point symbol found on topographic maps?



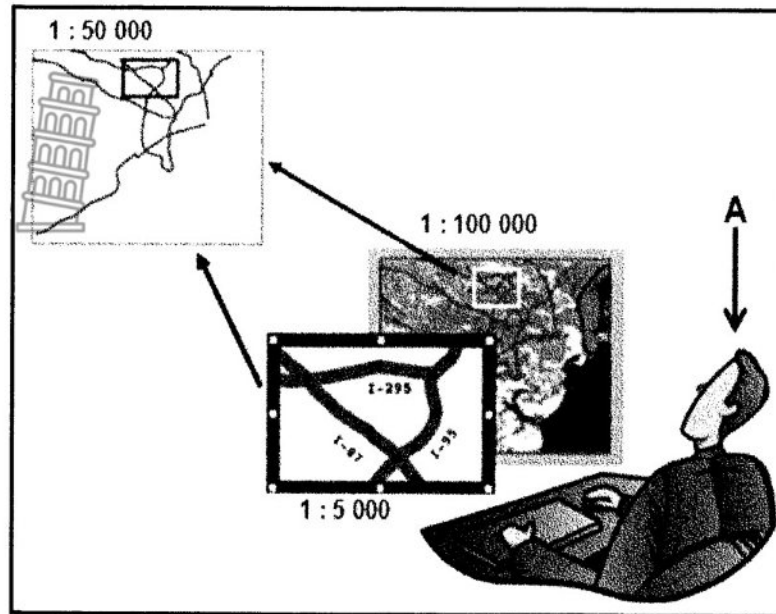
(1 x 1) (1)

- 3.3.2 Identify the alphanumeric block on the topographic map in which the point symbol (answer to QUESTION 3.3.1) is located. (1 x 1) (1)

- 3.3.3 Give ONE attribute data of the point symbol (answer to QUESTION 3.3.1) evident on the topographic map. (1 x 1) (1)



Refer to the sketch below.

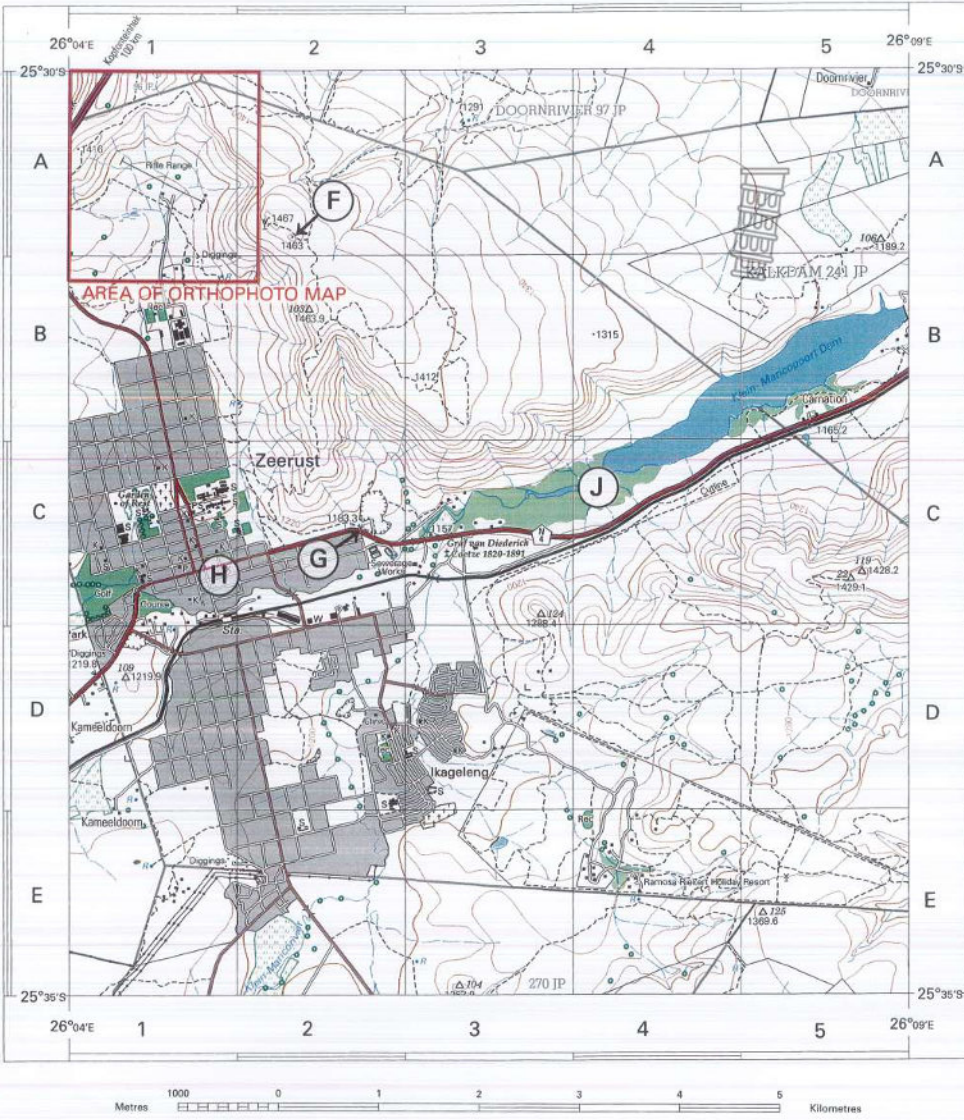


[Source: <https://www.directionsmag.com/article/3396>]

- 3.3.4 Identify the GIS component at A. (1 x 1) (1)
- 3.3.5 Give ONE reason why the GIS component (answer to QUESTION 3.3.4) is important. (1 x 2) (2)
- 3.3.6 Data integration is illustrated in the sketch.
Give ONE reason to support the statement. (1 x 2) (2)

TOTAL SECTION B: 30
GRAND TOTAL: 150





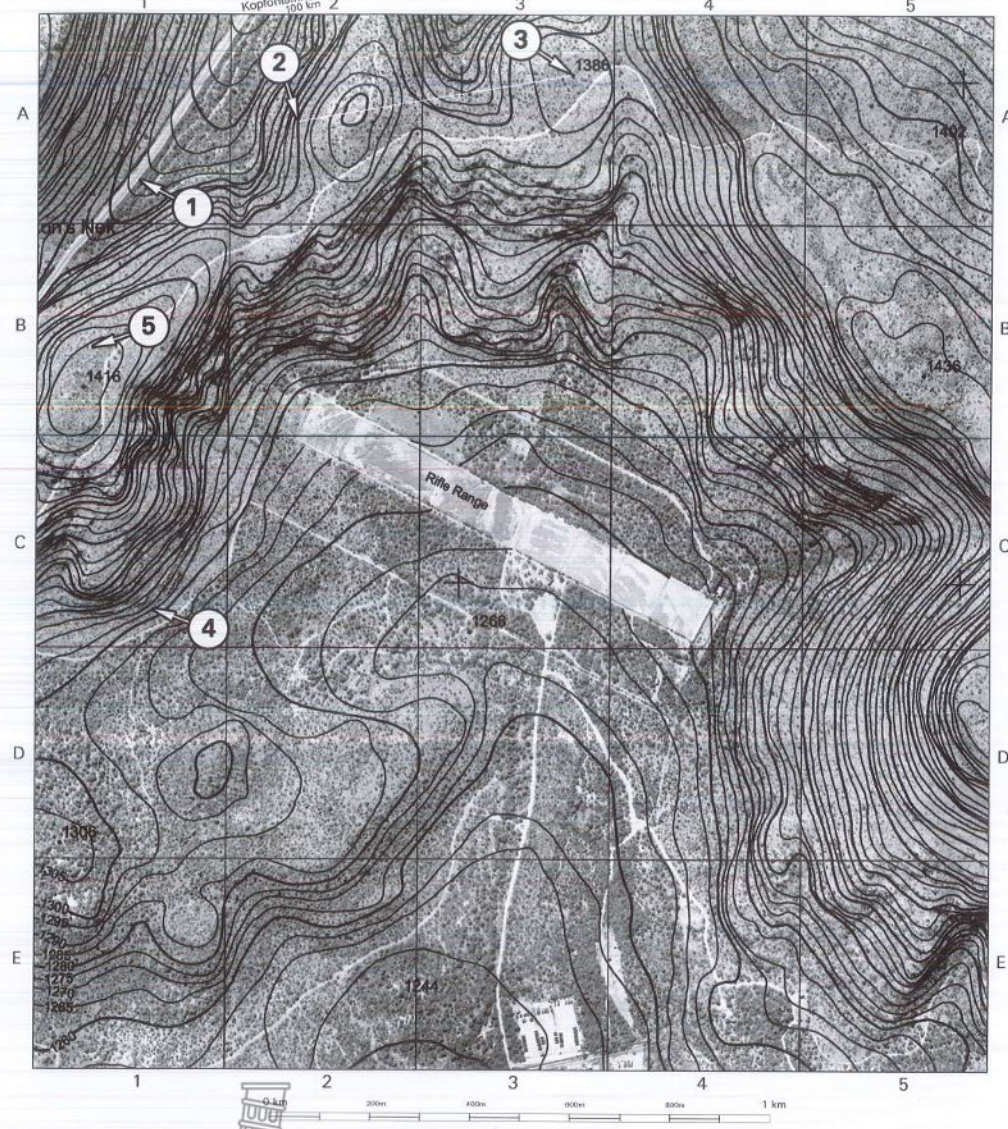
Gedownload van Suidmorephysic 161927, Nieuw van Wierden Noord (Augustus 2014). Gedownload van Suidmorephysic 161927, Nieuw van Wierden Noord (Augustus 2014).

Mean magnetic declination 18°57' West of True North (August 2014).
Mean annual change 3' Westwards (Aug. 2014 - July 2015).

CONTOUR INTERVAL 20 METRES / KONTOERTUSSENRUIMTE 20 METER

REFERENCE

National Freeway; National Route	International Boundary and Beacon	Fence; Wall	Windpump; Monument
Arterial Route	Provincial Boundary	Communication Tower	Mine Dump; Excavation
Main Road	Protected Area	Trigonometrical Station; Marine Beacon	Lighthouse and Marine Light
Secondary Road; Bench Mark	Perennial River	Cemetery; Grave	Erosion; Sand
Other Road; Bridge	Non-perennial River	Woodland	Cultivated Land
Track and Hiking Trail	Non-Perennial Water	Orchard or Vineyard	Recreation Ground
Railway; Station or Siding	Dry Water Course	Row of Trees	Original Farms
Other Railway; Tunnel	Marsh and Vlei	Water Tower; Reservoir; Water Point	
Power Line	Pipeline (above ground)	Coastal Rocks	
Build-up Area (High, Low Density)	Water Tower; Reservoir; Water Point	Prominent Rock Outcrop	
Buildings; Ruin	Post Office; Police Station; Store		
Place of Worship; School; Hotel	Place of Worship; School; Hotel		



CONTOUR INTERVAL 5 METRES - KONTOERTUSSENRUIMTE 5 METER

VERKLARING

Nasionale Deurpad; Nasionale Roete	Internasionale Grans en Baken	Draaibeining; Muur
Hoofverkeersroete	Provinciale Grans	Windpomp; Monument
Hoofpad	Bewarings Gebied	Kommunikasietoring
Sekondêre Pad; Hoogtemerk	Standhoudende Rivier	Myrboep; Uitgraving
Ander Pad; Brug	Standhoudende Water	Peilbaken; Seevaarbaken
Doonwe Pad en Voetslaanpad	Nie-standhoudende Rivier	Vuurtoring en Seevaartig
Spoorweg; Stasie of Syllyn	Nie-standhoudende Water	Begraafplaas; Graf
Ander Spoorweg; Tonnell	Droë Loop	Erosie; Sand
Opvulling; Deurgrawing	Droë Pan	Bebooste Gebied
Kraglyn	Moeras en Vlei	Bewerkte Land
Beboede Gebied (Hoë, Laë Digtheid)	Pympstasie	Watering
Geboue; Muraasie	Waterlooiing; Reservoir; Waterpunt	Ontspanningsgebied
Poskantoor; Polisieostasie; Winkel	Kuslynroete	Rye Bome
Plek van Aanblding; Skool; Hotel	Prominente Klipbank	Oorspronklike Plaas

Gedownload van Suidmorephysic 161927, Nieuw van Wierden Noord (Augustus 2014). Gedownload van Suidmorephysic 161927, Nieuw van Wierden Noord (Augustus 2014).

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Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

GEOGRAPHY P1

2023

MARKING GUIDELINES

MARKS: 150

Name	Designation	Signature	Date
Mrs. ZPL SHABALALA	Umalusi External Moderator		24.05.2023
Mr. GD SAMAAI	Umalusi External Moderator		24.05.2023
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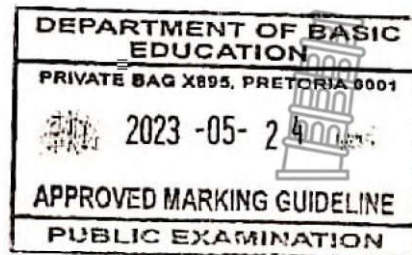
These marking guidelines consist of 11 pages.

SECTION A: CLIMATE AND WEATHER AND GEOMORPHOLOGY

QUESTION 1: CLIMATE AND WEATHER

- 1.1 1.1.1 D (1)
- 1.1.2 B (1)
- 1.1.3 A (1)
- 1.1.4 C (1)
- 1.1.5 B (1)
- 1.1.6 A (1)
- 1.1.7 B (1)
- 1.1.8 B (1) (8 x 1) (8)

- 1.2 1.2.1 Z (1)
- 1.2.2 Y (1)
- 1.2.3 Y (1)
- 1.2.4 Z (1)
- 1.2.5 Z (1)
- 1.2.6 Y (1)
- 1.2.7 Z (1) (7 x 1) (7)



1.3	1.3.1	Winter (1)	(1 x 1)	(1)
	1.3.2	(10/12/13) June /Date (1) Cold fronts in the interior of Western/Eastern Cape (1) High amounts of rainfall (1) Significant drop in temperature (1) [ANY ONE]	(1 x 1)	(1)
	1.3.3	Northward movement of the high pressure belts (anticyclones)/ITCZ (2) [ANY ONE]	(1 x 2)	(2)
	1.3.4	Backing (1)	(1 x 1)	(1)
	1.3.5	(The wind direction associated with the cold front will) change from north-west to south-west as the front moves over the Western Cape (2) [ANY ONE]	(1 x 2)	(2)
	1.3.6	Positive: Brings much needed moisture to the soil (2) Revival of biodiversity/ecosystem/habitat (2) Water available for wildlife (2) Water available for growth of natural vegetation (2) Water allows for more grazing land/veld (2) Fill up (by infiltration) natural aquifers/springs/groundwater (2) Fill up (via surface runoff) rivers (2) Negative: (Low-lying) areas are flooded (2) Soil erosion will increase (2) Destruction of biodiversity/ecosystem/habitat (2) Damage to natural vegetation (2) Loss of wildlife (2) Increase salination of rivers (2) Saturation of soil (waterlogged conditions) (2) Rock falls/mass movements on steeper slopes (2) [ANY FOUR, RESPONSES MUST REFER TO BOTH POSITIVES AND NEGATIVES]	(4 x 2)	(8)
1.4	1.4.1	Clockwise movement of air (1) Position of the leading left quadrant (1) Wind direction shown by the symbol of the eye (1) [ANY ONE]	(1 x 1)	(1)
	1.4.2	Pressure in the centre is significantly below 1000 hPa (1) Well-developed eye (1) The area covered by the tropical cyclone is large (450km-950km) (1) The leading left quadrant (dangerous semicircle) is visible (1) Isobars are closely spaced/pressure gradient is very steep (1) [ANY TWO]	(2 x 1)	(2)

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1.4.3 <small>INFLUENCE ON CLOUD COVER</small>	There will be no cloud cover/clear skies (2)	(1 x 2) (2)
1.4.4 <small>REASON FOR ANSWER</small>	Descending air heats up resulting in no condensation (2) Adiabatic heating reduces moisture/becomes dry (2) [ANY ONE]	(1 x 2) (2)
1.4.5 <small>RELATIONSHIP WIND SPEED AND AIR PRESSURE</small>	(a) Air pressure decrease and wind speed increases (2) (b) Both air pressure and wind speed decreases (2)	(2 x 2) (4)
1.4.6 <small>WHY ISOBARIC REPRESENTATION REFERRED TO LEFT HAND QUADRANT</small>	It experiences the most intense weather conditions (accept examples of severe weather conditions) (2)	(1 x 2) (2)
1.4.7 <small>HOW LEFT HAND QUADRANT DEVELOPS</small>	When the forward movement combines with the rotation of the system (2)	(1 x 2) (2)
1.5.1	A South Atlantic (1) B South Indian (1)	(2 x 1) (2)
1.5.2	Summer (1)	(1 x 1) (1)
1.5.3 <small>GIVE REASON FOR SUMMER</small>	Line thunderstorms (heavy rainfall) occur in the interior (2) Cumulonimbus clouds/lightning/hail (2) Moisture front developed (2) Air from the east/west reaches the interior (2) [ANY ONE]	(1 x 2) (2)
1.5.4 <small>WHAT IS A MOISTURE FRONT</small>	The boundary (dry line) between two air masses of different moisture content (2) [CONCEPT]	(1 x 2) (2)

INSTRUCTION FOR PART MARKING

The boundary (dry line) between **two air masses** (1)

1.5.5	(Heavy) Rainfall (1) Hail (1) Thunderstorms (1) [ANY TWO]	(2 x 1) (2)
1.5.6 <small>DESCRIBE THE FORMATION OF LINE THUNDER STORM</small>	Convergence of warm moist air and cold dry air (2) Moisture front develops (2) Cold dry air undercuts warm moist air (2) Warm moist air rises (2) Condensation occurs in the eastern side of the moisture front (2) Cumulonimbus clouds develops (2) [ANY THREE]	(3 x 2) (6)

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[60]

QUESTION 2 - GEOMORPHOLOGY

2.1.1 C (1)

2.1.2 A (1)

2.1.3 D (1)

2.1.4 B (1)

2.1.5 C (1)

2.1.6 B (1)

2.1.7 B (1)

2.1.8 C (1)

(8 x 1) (8)

2.2 2.2.1 Z (1)

2.2.2 Y (1)

2.2.3 Y (1)

2.2.4 Y (1)

2.2.5 Z (1)

2.2.6 Z (1)

2.2.7 Y (1)

(7 x 1) (7)

2.3 2.3.1 Upper (1)

(1 x 1) (1)

2.3.2 Deep valleys (2)
Narrow/V-shaped valley (2)
Steep slopes (2)
Gorge (2)
Interlocking spurs (2)
Vertical erosion is dominant (2)
[ANY TWO]

(2 x 2) (4)

2.3.3 A body of water's/river falling over hard rock/steep slope/vertical cliff (2)
[CONCEPT]

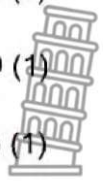
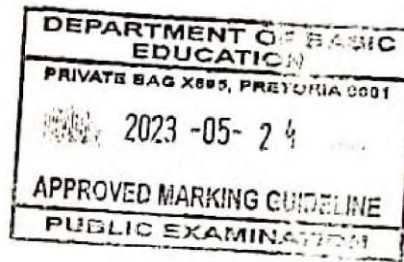
(1 x 2) (2)

INSTRUCTION FOR PART MARKING

A body of water's/river falling over (1)

2.3.4 Y- resistant/hard rock (1)
Z- less resistant/ soft rock (1)

(2 x 1) (2)

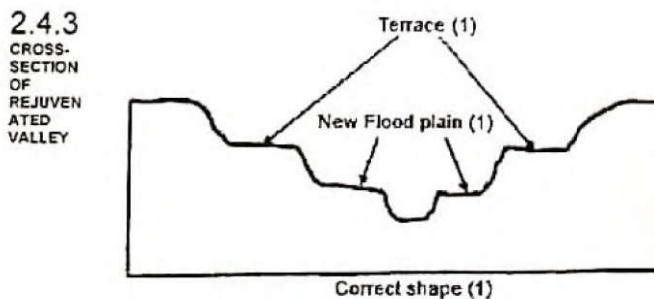


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2.3.5 The softer rock (Z) is eroded leaving the hard rock (Y) exposed (2)
 HOW DOES EROSION CAUSE RETREAT OF WATER FALL
 Erosion/undercutting of less resistant/soft rock occurs (2)
 Erosion/undercutting will create a plunge pool (2)
 The resistant/hard rock (Y) is not supported by the soft rock (Z) and overhang (2)
 The overhanging resistant/hard rock collapses (2)
[ANY THREE] (3 x 2) (6)

2.4 2.4.1 A process where a river **regains energy** (and begins to erode vertically/downwards again) (2)
 WHAT IS REJUVENATION
[CONCEPT] (1 x 2) (2)

2.4.2 Change in gradient (1) OR
 STATE TWO CAUSES OF REJUVENATION
 (Accept Isostatic uplift (1) and/or Drop in sea level (1))
 Increase in the volume of water (1) OR
 (Accept Increase in rainfall (1) and/or River capture (1))
 Joining of a faster tributary (1)
[ANY TWO] (2 x 1) (2)



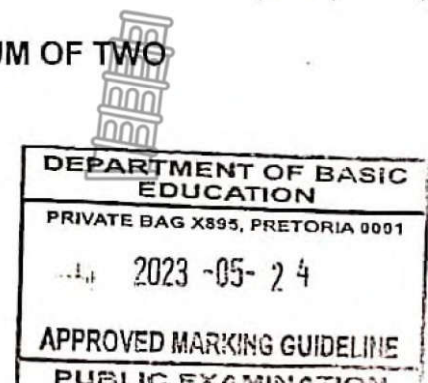
Mark distribution
 Mark for correct shape of cross section (1)
 Mark for indicating new flood plain on cross-section (1)
 Mark for indicating ANY ONE Terrace on cross-section (1) (3 x 1) (3)

2.4.4 A rejuvenated river cuts into the valley floor (2)
 FORMATION OF RIVER TERRACES
 Downcutting creates a new flood plain (2)
 A step forms between the old and new flood plains (2)
[ANY TWO] (2 x 2) (4)

2.4.5 Steepness of slopes will hamper construction of roads/railway lines (2)
 EXPLAIN HOW LANDSCAPE NEGATIVELY IMPACTED INFRASTRUCTURE DEVELOPMENT
 Softness of the underlying rocks causes instability to roads/ railway construction (2)
 Terraces make it costly to build bridges (2)
 Wide flood plain makes it difficult to build bridges (2)
[ANY TWO] (2 x 2) (4)

INSTRUCTION FOR PART MARKING- MAXIMUM OF TWO

- Steepness of slopes (1)
- Softness of the underlying rocks (1)
- Terraces (1)
- Wide flood plain(1)



2.5	2.5.1	Coal mine waste have spilled into rivers (1) Polluted mine waste burst from a slurry dam (1) [ANY ONE]	(1 x 1)	(1)
	2.5.2	Arsenic copper (1) Lead (1) Manganese (1) [ANY TWO]	(2 x 1)	(2)
	2.5.3	"the residents of the affected communities were not warned about the potential hazards until two weeks later" (2) "Conservation managers in the neighboring Hluhluwe – Imfolozi Game Reserves were also made to believe that the spill was under control " (2) [ANY ONE]	(1 x 2)	(2)
	2.5.4	Eco-tourism affected (2) Businesses in the community negatively affected (2) Agricultural activities negatively affected (2) Future investments in the communities limited (2) Contamination of agricultural products (2) Increase in medical bills (2) (Water) purification is expensive (2) [ANY ONE]	(1 x 2)	(2)
	2.5.5	IMPORTANCE: To ensure the availability of water (2) To maintain water quality (2) To preserve aquatic life (2) To ensure that the ecosystem remains healthy (2) To preserve biodiversity/ecosystem/habitat (2) MEASURES: Continuous monitoring of the dam (2) Regular maintenance of the dam (2) Frequent testing of water quality (2) Impose fines to companies which do not comply (with regulation) (2) Create buffer zone around slurry dam (2) Educate community on the precautionary measures (2) Awareness campaigns for people (bill boards, no dumping site signs) (2) Implement policy/legislation (2) Conserve natural vegetation in the drainage basins (2) Regulate or control extraction of groundwater (2) Promote sustainable farming methods upstream (2) [ANY FOUR, RESPONSES MUST INCLUDE BOTH THE IMPORTANCE AND MEASURES]	(4 x 2)	(8) [60]

CAUSE FOR BLACK COLOUR RIVER

QUOTE MINING COMPANY DID NOT DISCLOSE

NEGATIVE ECONOMIC IMPACT OF NON DISCLOSURE

DESCRIBE THE ENVIRONMENTAL IMPORTANCE OF MANAGING IMFOLOZI


SUGGEST MEASURES LOCAL MUNICIPALITY CAN IMPLEMENT TO MAINTAIN FUTURE QUALITY OF WATER

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TOTAL SECTION A: 120

SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

3.1	3.1.1	B (1)	(1 x 1)	(1)
	3.1.2	D (1)	(1 x 1)	(1)
	3.1.3	 $VI = 1463 - 1183.3 = 279.7 \text{ (1) m}$ $\frac{VI = 279.7}{HE = 3000} \text{ (1) for correct substitution}$ <p>Gradient = 1: 10.72 (1)</p>	(3 x 1)	(3)
	3.1.4	<p>The gradient is steep (1)</p> <p>There are a number of valleys/rivers (1)</p> <p>There are a number of spurs (1)</p> <p>There is an excavation close by (1)</p> <p>[ANY TWO]</p>	(2 x 1)	(2)
	3.1.5	<p>(a) 1: 20 x 100 = 2000 (1)</p> <p>1: 2000 (1)</p> <p>(b) The cross-section (of the topographic map) has been vertically exaggerated by 5 times/The cross-section is 5 times larger (1)</p>	(2 x 1)	(2)
			(1 x 1)	(1)
3.2	3.2.1	C (1)	(1 x 1)	(1)
	3.2.2	<p>Built-up areas (1)</p> <p>Road (1)</p> <p>[ANY ONE]</p>	(1 x 1)	(1)
	3.2.3	<p>More heat is generated (accept examples) (2)</p> <p>The built-up area absorbs more heat (accept examples) (2)</p> <p>Multiple reflections (2)</p> <p>Storm water drainage (2)</p> <p>[ANY ONE]</p>	(1 x 2)	(2)
	3.2.4	<p>Woodlands/trees (1)</p> <p>Rivers/ water (1)</p> <p>Open spaces (1)</p> <p>[ANY ONE]</p>	(1 x 1)	(1)
	3.2.5	C (1)	(1 x 1)	(1)
	3.2.6	<p>Gentle slope (flat land) (2)</p> <p>Surrounding high-lying area creates safety (2)</p> <p>Surrounding high-lying area will buffer the noise (2)</p> <p>[ANY ONE]</p>	(1 x 2)	(2)

EVIDENCE FOR DIFFICULTY TO CONSTRUCT ROAD

IDENTIFY HUMAN MADE FEATURE

EXPLAIN YOUR ANSWER

IDENTIFY NATURAL FEATURE

HOW RELIEF FAVOURS LOCATION

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	3.2.7	The settlement is away from the dam (2) The woodland forms a buffer (2) Most tributaries feeding the dam have their origin in high-lying areas with no human activities (2) [ANY TWO]	(2 x 2)	(4)
3.3	3.3.1	B (1)	(1 x 1)	(1)
	3.3.2	C3 (1)	(1 x 1)	(1)
	3.3.3	Name of the monument (1) The date of birth and death of Diederich Coetzee (1) Height of the monument above sea level (1) [ANY ONE]	(1 x 1)	(1)
	3.3.4	Personnel/ people/ user (1)	(1 x 1)	(1)
	3.3.5	Manipulate the data (2) Input of data (2) Use appropriate GIS methods (2) Make information more accessible to users (2) Make information more understandable for users (2) Acquires the soft and hardware to be used (2) Acquire/collect data (2) [ANY ONE]	(1 x 2)	(2)
	3.3.6	Different maps were integrated into one map (2)	(1 x 2)	(2)

TOTAL SECTION B: 30
 GRAND TOTAL: 150

