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**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

NOVEMBER 2019

**GEOGRAPHY P2
MARKING GUIDELINE**

MARKS: 75

This marking guideline consists of 13 pages.

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

QUESTION 1: The questions below are based on the 1 : 50 000 topographic map 2828 CB CLARENS, as well as the orthophoto map of a part of the mapped area. Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) in the block next to each question.

1.1 Label **A** on the location map (page 3) indicates ...

- A Free State.
- B Gauteng.
- C Lesotho.
- D KwaZulu-Natal.

C

1.2 The map reference of the topographic map sheet to the south-west of 2828 CB CLARENS is ...

- A 2828AD.
- B 2828BC.
- C 2828CC.
- D 2828DA.

C

1.3 The Townlands Dam labelled **1** on the orthophoto map is to the ... of the town of Clarens.

- A south-west
- B south-east
- C South
- D West

B

1.4 The primary economic activity at **B** in block **F6** is a/an ...

- A sportsfield.
- B dam.
- C excavation.
- D non-perennial river.

C

1.5 The human-made feature **2** on the orthophoto map is a ...

- A dam.
- B reservoir.
- C building.
- D water tower.

B

1.6 The buildings at **3** on the orthophoto map represent a ...

- A shopping mall.
- B church.
- C school.
- D clinic.

C

1.7 The feature labelled **C** in block **D8** on the topographic map is a/an ...

- A sand.
- B erosion.
- C marsh and vlei.
- D dry pan.

B

1.8 The number **2828** on the topographic map refers to ...

- A latitude and longitude.
- B longitude and latitude.
- C latitude.
- D longitude.

A

1.9 A human feature found at 28° 31' 24" S and 28° 25' 32" E is a ...

- A cemetery.
- B place of worship/church.
- C clinic.
- D school.

B

1.10 The difference in height between trigonometric station 8 in block **A8** and Mount Zion spot height 1892 in block **B7**, is ... m.

- A 1884
- B 557
- C 900
- D 557,5

D

1.11 The rows of trees found on Braamhof farm, in block **C2**, are used as ...

- A demarcation.
- B windbreaks.
- C plantations.
- D firebreak.

B

1.12 Feature **D** on the topographic map is a/an ...

- A embankment.
- B mine dump.
- C excavation.
- D cutting.

D

1.13 The slope represented by the line running from **4** to **5** on the orthophoto map is a ... slope.

- A convex
- B terrace
- C uniform
- D concave

D

1.14 The feature between **6** and **7** is a ...

- A pass.
- B gorge.
- C saddle.
- D ridge.

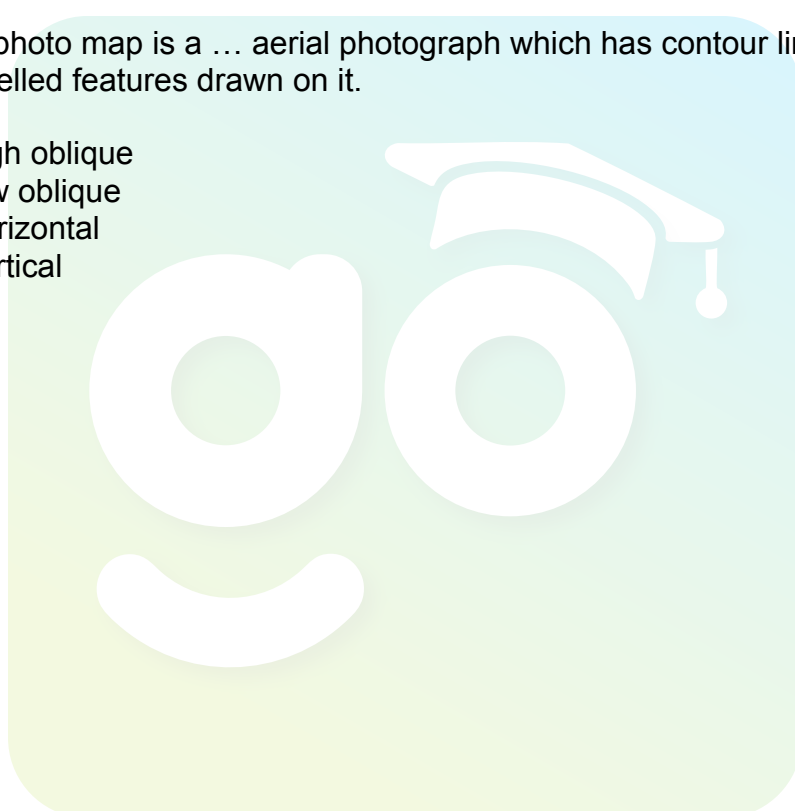
C

1.15 An orthophoto map is a ... aerial photograph which has contour lines and other labelled features drawn on it.

- A high oblique
- B low oblique
- C horizontal
- D vertical

D

[15]



QUESTION 2: MAPWORK CALCULATIONS AND TECHNIQUES

2.1 Refer to the trigonometric station 8, in block **A8**, and spot height 2169, in block **A7**.

2.1.1 Identify the landform between the two heights.

Ridge ✓

(1 x 1) (1)

2.1.2 Calculate the difference in height between the two points.

2 449,5 m – 2 169 m = 1 924,2 m ✓

(1 x 1) (1)

2.2 Refer to the line that runs from **8** to **9** on the orthophoto map.

2.2.1 Calculate the average gradient of the slope between contour 1780 (**8**) and spot height 2202 (**9**). Show ALL calculations. Marks will be awarded for calculations.

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

VI = 2 202 m – 1 780 m
= 422 m ✓

VI = 2 202 m – 1 780 m
= 422 m ✓

HE = 17 ✓ cm x 100 m

HE = $\frac{17 \text{ ✓ cm} \times 100\,000}{100}$

Range for measurement [16,9 cm to 17,1 cm]

= 1 700 m ✓

OR

= 1 700 m ✓

Range for HE [1690 m – 1710 m]

G = $\frac{422 \text{ ✓}}{1\,700}$

(One mark for)
correct substitution)

G = $\frac{422 \text{ ✓}}{1\,700}$

= 1 : 4,02 / 1 in 4,02 / $\frac{1}{4,02}$ ✓

= 1 : 4,02 / 1 in 4,02 / $\frac{1}{4,02}$

Range for final answer [1 : 4,00 – 1 : 4,05]

(5 x 1) (5)

2.2.2 (a) Would you describe the gradient you have calculated in QUESTION 2.2.1 as steep or gentle?

Steep ✓

(1 x 1) (1)

- (b) Explain your answer to QUESTION 2.2.2 (a).

*1 : 4,02 indicates that the slope is steep/1:4,02 indicates a steep slope ✓
 Rise is over a shorter distance ✓*

[Any ONE]

(1 x 1) (1)

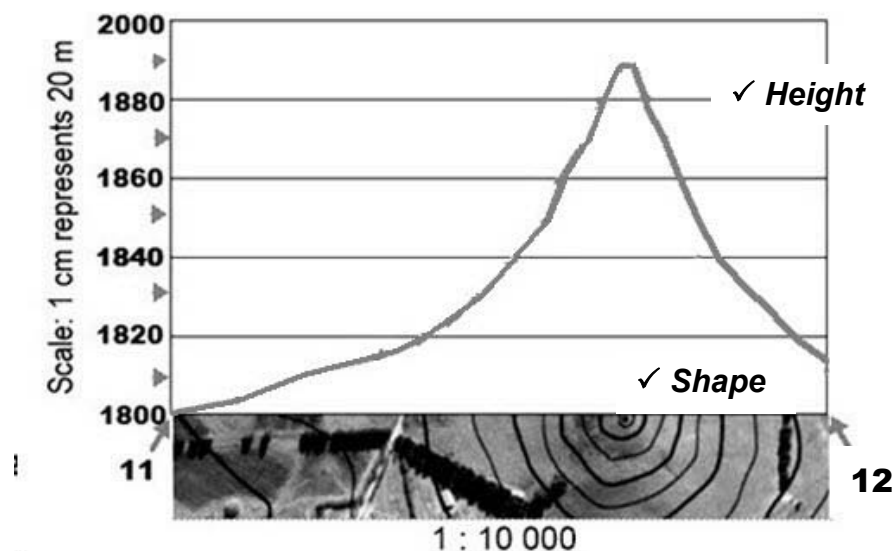
- 2.3 Refer to the feature labelled Mount Zion between line **11** and **12** on the orthophoto map.

- 2.3.1 What is the highest point of Mount Zion?

1 891 m ✓

(1 x 1) (1)

- 2.3.2 Use the contour lines below on the horizontal axis of the cross-section to complete the cross-section between **11** and **12** below. Some heights have been included to assist you.



(2 x 1) (2)

- 2.3.3 Write the vertical scale of the cross-section as a ratio.

1 : 2 000 ✓

(1 x 1) (1)

- 2.4 Calculate the magnetic bearing of trigonometrical station 175 (block **C5**) from the spot height 1768 (block **C4**) for the year 2019. Show ALL calculations. Marks will be awarded for calculations.

**Formula: Magnetic bearing = True bearing + Magnetic Declination
(TB + MD)**

$$2.4.1 \quad \text{True Bearing} = 65^\circ \checkmark \text{Range } [64^\circ - 66^\circ] \quad (1 \times 1) \quad (1)$$

2.4.2 Magnetic Declination for 2019

The difference in years: $2019 - 2010 = 9 \checkmark \text{ years}$

Mean annual change: $4' \checkmark W$

Total change: $9 \times 4' W = 36' \checkmark W$

$$\text{Magnetic declination for 2019: } 21^\circ 44' W + \checkmark 36' W = 22^\circ 20' W \checkmark \quad (5 \times 1) \quad (5)$$

$$2.4.3 \quad \text{Therefore the magnetic bearing for 2019: } 65^\circ + 22^\circ 20' = 87^\circ 20' \checkmark$$

$$\text{Range } (86^\circ 20' - 88^\circ 20') \quad (1 \times 1) \quad (1)$$

[20]

QUESTION 3: APPLICATION AND INTERPRETATION

- 3.1 Refer to the table below, the information on Clarens (on page 3) and the topographic map to answer the questions that follow.

Average monthly precipitation (mm) for Clarens

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
122	95	91	59	29	11	12	19	34	83	105	104

- 3.1.1 Name the season that experiences the lowest precipitation.

Winter ✓

(1 x 1) (1)

- 3.1.2 Calculate the average annual rainfall (mm) for Clarens.

764 / 12 = 63,67 mm ✓

(1 x 1) (1)

- 3.1.3 Given the above rainfall data and Clarens location, suggest ONE reason why there are many non-perennial streams in the area.

*Long dry winter – below average rainfall ✓✓
Area experiences seasonal rain ✓✓*

[Any ONE]

(1 x 2) (2)

- 3.2 Study both the photograph of the mountain range outside Clarens below and the area covered by blocks **A6/7** on the topographic map before attempting the questions below.

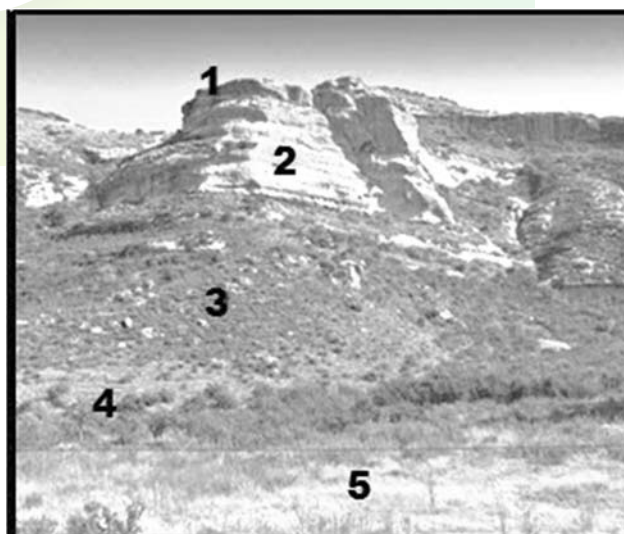
1. Crest ✓

2. Cliff ✓

3. Talus / Scree ✓

4. Knickpoint ✓

5. Pediment ✓



- 3.2.1 Next, to the photograph, label the slope elements (1–5) using the list below:

cliff; pediment; talus; crest; knickpoint

See photograph for answers.

(5 x 1) (5)

- 3.2.2 Give ONE topographic map evidence why the slope element 5 is much more suited for the construction of 712 main road.

Flat/gentle gradient/contour lines are spread out/not closely packed/ allows for easy construction of road ✓✓

[Any ONE]

(1 x 2) (2)

- 3.3 Refer to the blocks C7 and C8 on the topographic map.

- 3.3.1 In which general direction is the Little Caledon River flowing?
Give TWO reasons for your answer.

Answer: North west / NW / North north-west / NNW ✓

Reasons: The contour height decreases NW / NNW ✓✓

The spot heights decrease NW / NNW ✓✓

Most tributaries join the main river at acute angles ✓✓

The dam wall is in NW / NNW direction ✓✓

Dam water on the SE / SSE side of dam ✓✓

[Any TWO]

(1 + 2 x 2) (5)

- 3.3.2 What type of a river is the Little Caledon River in block D8?

Non-perennial ✓

(1 x 1) (1)

- 3.4 Rockfalls occur in blocks H3 and I2 on the topographic map.
Describe TWO factors that have increased the rockfalls in this area.

Road construction ✓✓

Gradient / steeper slope ✓✓

Cuttings through mountains ✓✓

[Any TWO]

(2 x 2) (4)

- 3.5 Refer to blocks **H7** and **H8** on the topographic map in which an NGO has been contracted to improve rural development.

- 3.5.1 Identify the main economic activity found in blocks **H7** and **H8**.

Crop farming / cultivation ✓

(1 x 1) (1)

- 3.5.2 State and explain ONE way in which the aid agency can improve on the economic activity mentioned in QUESTION 3.5.1.

Statement: *Infrastructure – Examples (Dams / Roads / Electricity)*

Explanation:

Dams – *for irrigation (canals / furrows) ✓✓*

Roads – *for supplies to and from the market ✓✓*

Finances – *providing funding for improvements ✓✓*

Electricity – *Construction of powerlines ✓✓*

[Any ONE]

(1 + 2) (3)

[25]



QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

- 4.1 Which data storage model, vector or raster, comes closest to the topographic map, as we know it?

Vector ✓

(1 x 1) (1)

- 4.2 Differentiate between *vector* and *raster* data.

Vector: *Uses points, lines and areas inside a polygon to define data stored in a computer ✓*

Raster: *Each area is divided into rectangular grid cells and each rectangular cell contains an attribute value and its location coordinates ✓*

[Concept]

(2 x 1) (2)

- 4.3 Answer the following on spatial resolution.

- 4.3.1 Define the term *spatial resolution*.

Refers to the amount of pixels used to construct a digital image ✓

[Concept]

(1 x 1) (1)

- 4.3.2 Does the orthophoto map or the topographic map have a higher spatial resolution?

Orthophoto map ✓

(1 x 1) (1)

- 4.4 A number of different GIS maps for Clarens are shown in FIGURE 4.4 (A–C) together with a key FIGURE 4.4 (D) on page 14.

- 4.4.1 With reference to FIGURES 4.4 (A–C), explain the GIS concept of overlaying.

GIS is a combination of different data layers put on top of each other ✓

[Concept]

(1 x 1) (1)

- 4.4.2 With reference to FIGURE 4.4 (D), what is *attribute data*?

*Data that describes/gives characteristics of spatial data (features)/
Quantifies and qualifies the feature ✓✓*

[Concept]

[Any ONE]

(1 x 2) (2)

- 4.4.3 Identify the type of symbol used in GIS with reference to FIGURES 4.4 A-C. Complete the table below by placing a tick in the correct box, indicating the type of symbol used in a GIS for the features listed below:

Symbol	Roads	Schools(S)	Land-use
Point		X ✓	
Line	X ✓		
Polygon (Area)			X ✓

(3 x 1) (3)

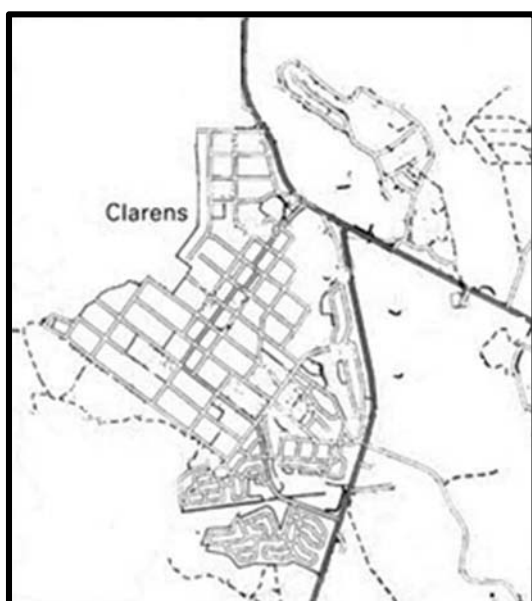


FIGURE 4.4 A Clarens: Roads and Rivers

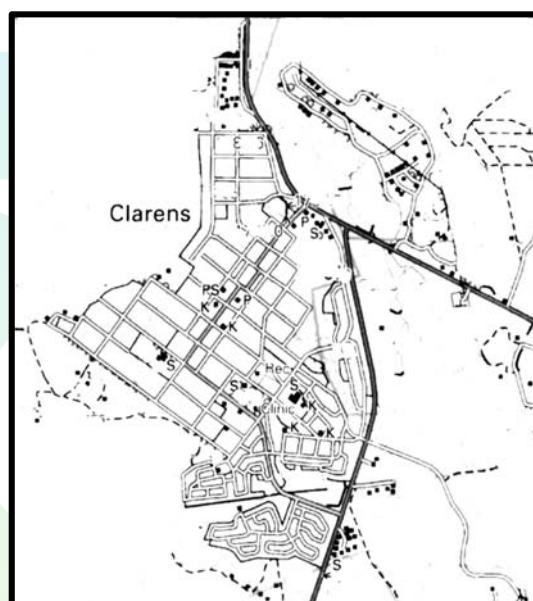


FIGURE 4.4 B Clarens: Land use

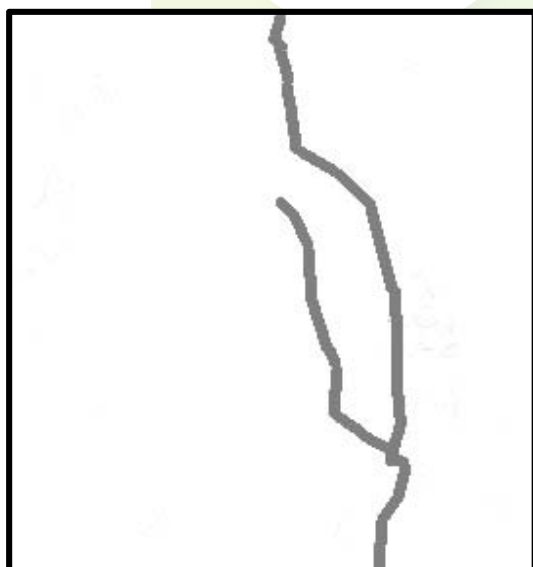


FIGURE 4.4 C Clarens: Buffer zones

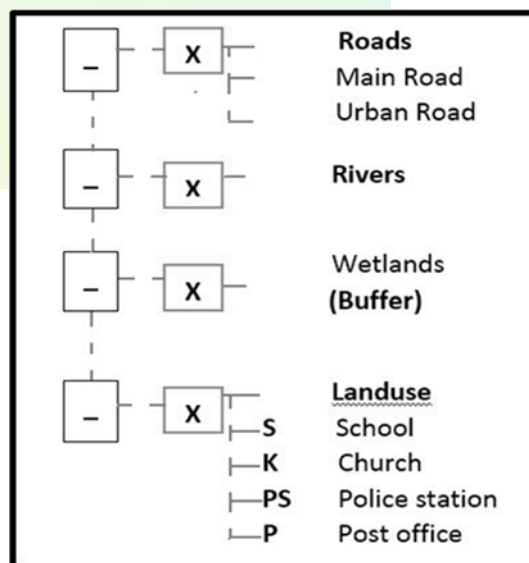


FIGURE 4.4 D Clarens: Key

4.5 The Department of Human Settlements (Housing) wants to build low cost housing in Clarens.

4.5.1 Suggest TWO data layers the department would need to consider in order to select the best site (position) for this housing project.

Transport layer ✓

The topography of the area ✓

The underlying rock structure ✓

Land use ✓

The proximity of facilities and services ✓

(2 x 1) (2)

4.5.2 Provide any ONE reason for the choice of the layer in your answer to QUESTION 4.5.1.

Transport routes: Accessibility for new residents ✓✓

Accessibility: Convenience for residents ✓✓

Topography: Suitable slope for building ✓✓

Underlying rock structure: suitable / stable structure for building ✓✓

Land Use: Zoning rights and neighbouring land uses ✓✓

The proximity of facilities / services: Within reasonable distance ✓✓

[Any ONE]

(1 x 2) (2)

[15]

TOTAL: 75