



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

JUNE 2016

**GEOGRAPHY P2
MEMORANDUM**

MARKS: 75

This memorandum consists of 8 pages.

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

The question below is based on the 1:50 000 topographical map 2829 DB LADYSMITH, 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 (1–1.15).

1.1 Route 103 to Harrismith in block **C1** is a/an ...

- A other road.
- B secondary road.
- C national road.
- D main road.

D

1.2 The highest point of Mbulwana hill in blocks **E6/7** and blocks **F6/7** is ... meters above sea level.

- A 1186
- B 331
- C 1229,1
- D 1140

C

1.3 The built-up area in block **E10** is of ... density.

- A medium
- B low
- C high
- D the highest

B

1.4 The index orthophoto map sheet north east of **2829 DB 6 LADYSMITH** is ...

- A 2828 DA5.
- B 2829 DB11.
- C 2829 DB2.
- D 2829 DB1.

C

1.5 The town located 98 km from the mapped area is ...

- A Newcastle.
- B Harrismith.
- C Glencoe.
- D Colenso.

A

1.6 The human-made feature **K**, in blocks **G6** and **H6** is ...

- A a railway station.
- B Hermanus Kraal farm.
- C a railway tunnel.
- D a railway bridge.

C

1.7 The area, **3**, on the orthophoto map is a/an ...

- A industrial area.
- B school recreation ground.
- C military recreation ground.
- D golf course.

C

1.8 The landform between **1** and **2** on the orthophoto map is a ...

- A waterfall.
- B river valley.
- C butte.
- D spur.

B

1.9 The land-use zone **6** on the orthophoto map is a/an ...

- A industrial zone.
- B rural-urban fringe.
- C residential zone.
- D recreational zone.

B

1.10 Diggings in block **A2** on the topographic map are ... economic activities.

- A primary
- B secondary
- C tertiary
- D quaternary

B

1.11 The contour interval on the orthophoto map is ... meters.

- A 15
- B 10
- C 20
- D 5

D

1.12 The land use at Cauvins Hope, in block **G6**, on the topographic map is ...

- A cultivated land.
- B a recreation ground.
- C a built up area.
- D an industrial area.

A

1.13 The rural settlement pattern marked **S**, in block **D10**, on the topographic map is ...

- A linear.
- B circular.
- C dispersed.
- D regular.

C

1.14 The topographic map scale of 1:50 000 means that one centimetre on the map represents ... kilometres in reality.

- A 0,1
B 0,05
C 0,5
D 1

C

1.15 The approximate distance between points **4** and **5** on the orthophoto map is ... kilometres.

- A 0,3
B 30
C 1,5
D 15

A

(15 x 1) [15]

QUESTION 2: MAPWORK CALCULATIONS AND TECHNIQUES

2.1 Refer to the topographic map and orthophoto map to answer the following questions:

2.1.1 How many kilometres would you travel by train from point **U** in block **B2** on the topographic map to Harrismith?

Formula: Distance x Scale

$5,4 \text{ cm} \times 0,5 = 2,7 \text{ km} \checkmark$ $2,7 \text{ km} + 80 \text{ km} \checkmark$ $82,7 \text{ km} \checkmark$	OR	$5,4 \text{ cm} / 2 = 2,7 \text{ km} \checkmark$ $2,7 \text{ km} + 80 \text{ km} \checkmark$ $82,7 \text{ km} \checkmark$	(3)
$(5,2 - 5,6 \text{ cm})$		$[Range = 82,6 \text{ km} - 82,8 \text{ km}]$	(3 x 1)

Note: No marks if units are not indicated in the final answer.

2.1.2 Determine the true bearing of spot height 1096 in block **B9** from the spot height 1101 in block **C9** on the topographic map.

$15^\circ [range 13^\circ - 17^\circ] \checkmark$	(1 x 1)	(1)
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2.2 Calculate the average gradient between **4** and **5** on the orthophoto map. Show ALL calculations. Marks will be awarded for calculations.

2.2.1 **Formula:** $Gradient = \frac{\text{Vertical interval (VI)}}{\text{Horizontal equivalent (HE)}}$

$VI = 1080 \text{ m} - 1015 \text{ m} = 65 \text{ m} \checkmark$ $HE = \frac{3 \text{ cm} \checkmark \times 10\,000}{100} = 300 \text{ m} \checkmark$ $Gradient = \frac{65 \text{ m}}{300 \text{ m} \checkmark} = 1 : 4,6 \checkmark [2\,250 \text{ m} - 2\,350 \text{ m}] \checkmark$ $= 1 : 4,6 \checkmark$	$VI = 1080 \text{ m} - 1015 \text{ m} = 48 \text{ m} \checkmark$ $HE = 3 \text{ cm} \checkmark \times 100$ $Gradient = \frac{48 \text{ m}}{300 \text{ m} \checkmark} = 1 : 4,6 \checkmark$ $= 1 : 4,6 \checkmark$	$[2,8 \text{ cm} - 3,2 \text{ cm}]$ $[Range: 4,3 - 4,9]$	(5 x 1)	(5)
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2.2.2 Describe the gradient you calculated in QUESTION 2.2.1.

$The \text{ gradient is steep because the value is less than } 1 : 10 \checkmark$ $The \text{ smaller the value the steeper the gradient} \checkmark$	(1 x 1)	(1)
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2.3 Is there Intervisibility between points 4 and 5 on the orthophoto map? Give TWO reasons evident on the orthophoto map to support your answer.

Yes ✓
There are no obstructions between points 4 and 5 ✓
The slope is concave, therefore can easily see point 4 from point 5 ✓
Point 5 is on the higher elevation (1 080 m) than point 4 (1 015 m) ✓ (3 x 1)

(3)

2.4 A cross-section is drawn between points 4 and 5 on the orthophoto map. Assume that the vertical scale is 1 cm = 20 m.

2.4.1 What is the importance of drawing cross-sections?

They help us in understanding gradient/slope types ✓
They help us to identify landforms ✓
Cross-sections are useful for determining Intervisibility ✓
Cross-sections provide a good idea of the steepness of the slope ✓
(CONCEPT) (Any 1 x 1)

(1)

2.4.2 Calculate the vertical exaggeration of the cross-section between 4 and 5.

Formula: $Vertical\ exaggeration = \frac{Vertical\ scale\ (VS)}{Horizontal\ scale\ (HS)}$

1 cm = 20 m
VS = 20 m = 20 x 100 = 2000 ✓
HS = 1 : 10 000 ✓
 $Vertical\ exaggeration = \frac{\frac{1}{2\ 000}}{\frac{1}{10\ 000}} = \frac{1}{2\ 0} \times \frac{10\ 000}{1} = \frac{10}{2} = 5\ times\ ✓$
No units in the final answer NO marks. The candidate will only get the maximum of 4 marks.

(5 x 1)

(5)

2.4.3 Suggest ONE reason why the vertical scale in a cross-section is exaggerated/made bigger?

It allows for relief features to be seen clearly/easy interpretation of relief features ✓
It makes the landforms to be more visible ✓
If the vertical scale is not exaggerated, the relief features will be flat ✓
(CONCEPT) (Any 1 x 1)

(1)

[20]

QUESTION 3: APPLICATION AND INTERPRETATION

Refer to both topographic map and the orthophoto map when answering the questions below.

3.1 Suggest ONE reason evident on the topographic map that influenced the engineers to construct the relatively straight course of the railway line in blocks F4 and F5.

Gentle slope ✓
Widely spaced contour lines ✓
Flat land ✓ (Any 1 x 1)

(1)

- 3.2 Generally, Ladysmith receives limited rainfall. Give TWO reasons evident on the map to support the statement.

<i>Plenty of dams ✓✓</i> <i>Cultivated lands along rivers ✓✓</i> <i>Presence of furrows/canals to transfer water ✓✓</i> <i>Availability non-perennial rivers ✓✓</i>	(Any 2 x 2)	(4)
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- 3.3 Suggest ONE piece of topographic map evidence that indicates that the discharge of the Klipriver fluctuates/changes during the certain times of the year.

<i>Presence of non-perennial water along its river course. ✓✓</i>	(1 x 2)	(2)
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- 3.4 In the South Western part of the mapped area, there is evidence of the frequency of veld fires. How do Ladysmith residents deal with the threat of Veld fires? Use ONE map evidence to support your answer.

<i>There are firebreaks ✓</i> <i>There are few dams ✓</i>	(Any 1 x 1)	(1)
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- 3.5 Locate the drainage basin labelled **V** in block **A1** and **A2** on the topographic map and then answer the questions below.

- 3.5.1 Identify the drainage pattern of the drainage basin labelled **V**.

<i>Dendritic ✓</i>	(1 x 1)	(1)
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- 3.5.2 In which general direction is the Bell's Spruitriver, in blocks **A1** and **A2** flowing?

<i>South easterly direction/SE ✓</i>	(1 x 1)	(1)
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- 3.5.3 Give TWO reasons, evident on the topographic map to support your answer to QUESTION 3.5.2.

<i>Tributaries of the Bell's river join at acute angle/down stream ✓✓</i> <i>Dams walls are in the SW indicating down stream ✓✓</i> <i>High values of spot heights are found in the NW whilst lower values are in SE ✓✓</i>	(Any 2 x 2)	(4)
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- 3.5.4 Determine the stream order of the Bell's Spruit at point **W**, in block **A2** on the topographic map.

<i>3rd order stream ✓✓</i>	(1 x 2)	(2)
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- 3.6 Refer to Hillside in block **E2/3** on the topographic map and also on the orthophoto map.

- 3.6.1 Identify the street pattern at Hillside?

<i>Grid iron ✓</i>	(1 x 1)	(1)
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- 3.6.2 Suggest ONE physical factor evident on both topographic and orthophoto maps that influenced the choice of street pattern in QUESTION 3.6.1 above.

<i>The land is relatively flat ✓✓</i> <i>Gentle slope as contour lines are spaced out ✓✓</i>	(1 x 2)	(2)
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3.6.3 State ONE advantage and ONE disadvantage of the street pattern (answer to QUESTION 3.6.1).

<p>Advantage: <i>It is regulated and easy to extend ✓</i> <i>Easy to find your way around/cannot get lost easily ✓</i> <i>Easy to control ✓</i></p> <p>Disadvantage: <i>It has many intersections ✓</i> <i>There is traffic congestion ✓</i> <i>Leads to accidents ✓</i> <i>Wastes fuel because there are many stop streets and traffic lights. ✓</i></p>	<p>(Any 1)</p> <p>(Any 1)</p>
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(2)

3.7 Soil erosion is occurring extensively in block D5 on the topographic map. Suggest TWO strategies that may be implemented to minimise this problem.

<p><i>Afforestation programmes (Planting of indigenous trees). ✓✓</i> <i>Building anti-erosion walls. ✓✓</i> <i>Awareness programmes to educate farmers about environmentally sustainable farming practices. ✓✓</i> Accept any reasonable answer.</p>	<p>(Any 2 x 2)</p>
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(4)
[25]

QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

4.1 Match the concepts in COLUMN A with statements in COLUMN B. Write ONLY the correct letter (A–F) next to the question number (4.1.1–4.1.5), for example 4.1.6 G.

4.1.1	F	A computer program application.
4.1.2	E	Characteristic of a feature that contains measurements of value for the feature.
4.1.3	D	A question, especially if asked to a data base by the user via database management systems.
4.1.4	A	A map designed to show a single spatial distribution pattern, using a specific map type.
4.1.5	B	Data that can be linked to locations in geographic space, usually via features on the map.

(5 x 1) (5)

4.2 Which ONE, the topographic map or the orthophoto map, is an example of vector data? Explain your answer.

<p><i>Topographic map ✓</i> <i>Reason: Real world objects are represented in form of lines, points and polygons ✓✓</i></p>	<p>(1 + 2)</p>
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(3)

4.3 Locate the Klipriver in block G7. Give ONE attribute of the Kliprivier.

<p><i>The Kliprivier has meandering channel ✓</i> <i>The river has non-perennial water along its course ✓</i> <i>The river has a braided channel ✓</i></p>	<p>(1 x 1)</p>
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(1)

4.4 Refer to the images **A** and **B** below which show different spatial resolution.

4.4.1 With reference to images **A** and **B**, define *spatial resolution*.

This refers to the degree of detail and clarity in terms of the location and shape of the geographic features ✓ (1 x 1) (1)

4.4.2 Several factors determine the spatial resolution of an image. Explain TWO factors that might have caused images **A** and **B** to have different spatial resolutions.

The quality of the camera in terms of the pixels. ✓ A camera with 3.0 megapixels will produce an image of poorer quality compared to a 10.0 megapixel camera. ✓

The scale ✓ at which the object was taken. For example large scale maps show more detail and clarity and therefore have a better resolution.

(1: 10 000 vs. 1: 50 000) ✓

(2 x 2)

(4)

4.4.3 Soil erosion in block **G3** is likely to affect the area in **F3**. Mention ONE data layer in blocks **G3** and **F3** that GIS specialist can use to stop the spread of soil erosion.

Relief layer ✓

Land-use ✓

Geology ✓

Vegetation ✓

Drainage ✓

(Any 1 x 1)

(1)

[15]

TOTAL: 75