basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE

GRADE 12

GEOGRAPHY P2

FEBRUARY/MARCH 2013

MEMORANDUM

MARKS: 100

MARK SCORED	Q1	Q2	Q3	Q4	TOTAL
MARKER					
SENIOR MARKER					
CHIEF MARKER					
MODERATOR					
TOTAL	20	20	40	20	100

This memorandum consists of 11 pages.

RESOURCE MATERIAL

1.   An extract from topographical map 2829AC HARRISMITH.

2.   Orthophoto map 2829AC 3 HARRISMITH.

3.   **NOTE:**   The resource material must be collected by the schools for their own use.

INSTRUCTIONS AND INFORMATION

1.   Fill in your EXAMINATION NUMBER and your CENTRE NUMBER in the spaces provided on the cover page.

2.   Answer ALL the questions in the spaces provided in this question paper.

3.   You are supplied with a 1:50 000 topographical map 2829AC of HARRISMITH and an orthophoto map of a part of the mapped area.

4.   You must hand in the topographical map and the orthophoto map to the invigilator at the end of this examination session.

5.   You must use the blank page at the back of this paper for all rough work and calculations. Do NOT detach this page from the question paper.

6.   Show ALL calculations and the formulae where applicable. Marks will be allocated for this.

7.   You may use a non-programmable calculator.

8.   The following English terms and their Afrikaans translations are shown on the topographical map.

ENGLISH	AFRIKAANS
Diggings	Uitgrawings
Caravan Park	Karavaanpark
Sewage Works	Rioolwerke
River Mouth	Riviermond
Golf Course	Gholfbaan
Wetland	Vlei

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

The questions below are based on the 1:50 000 topographical map 2829AC HARRISMITH, 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   The map projection used on the Harrismith map is the ... projection.

      A   Lambert
      B   Mercator
      C   universal transverse
      D   Gauss conformal

D

1.2   The recreational feature marked **B** on the topographical map is a …

      A   sports field.
      B   swimming pool.
      C   golf course.
      D   plantation.

A

1.3   On the orthophoto map the area labelled **7** is an example of a/an … residential area.

      A   high-income
      B   low-income
      C   middle-income
      D   informal

D

1.4   The index of the topographical map sheet to the southeast of 2829AC Harrismith is …

      A   2829CB.
      B   2828DB.
      C   2829AB.
      D   2828BB.

A

1.5   The type of slope labelled **3-4** on the orthophoto map is…

      A   concave.
      B   convex.
      C   terraced.
      D   uniform steep.

B

1.6   The drainage pattern in block **A13/14** on the topographical map is …

      A   trellis.
      B   rectangular.
      C   dendritic.
      D   radial.

C

1.7 The N3 is a/an …

    A   main road.
    B   arterial route.
    C   secondary road.
    D   national route.

$\boxed{\textbf{\textit{D}}}$

1.8 The height of the land at the trigonometrical station number 299 in block **C9** on the topographical map is …

    A   299 m.
    B   1757,2 m.
    C   299 km.
    D   1751,2 km.

$\boxed{\textbf{\textit{B}}}$

1.9 The river in block **F13/14** on the topographical map is in the …course.

    A   upper
    B   middle
    C   lower
    D   upper and middle

$\boxed{\textbf{\textit{C}}}$

1.10 The land-use zone numbered **11** on the orthophoto map is the … zone.

    A   industrial
    B   transition
    C   residential
    D   built up area

$\boxed{\textbf{\textit{A}}}$

(10 x 2) **[20]**

QUESTION 2: CALCULATIONS AND APPLICATION

2.1 Calculate the gradient of the slope between spot height 1729 **(8)** and spot height 1794 **(9)** on the orthophoto map.

Gradient = $\dfrac{VI}{HD/HE}$ ✓   **OR**   *Gradient =* $\dfrac{VI}{HD/HE}$ ✓

$= \dfrac{1794 - 1729}{10\ cm \times 100}$ ✓   *VI = 1794 – 1729* ✓
                                                          = 65 m

$= \dfrac{65}{1000}$ ✓   *HD/HE = 10 cm* ✓ *x 100*
                                                = 1000 m

= 1 : 15.38 ✓   *Gradient =* $\dfrac{65}{1000}$ ✓
(Range: 1 : 15.08 to 1 : 15.69)

                                                 = 1 : 15.38 ✓
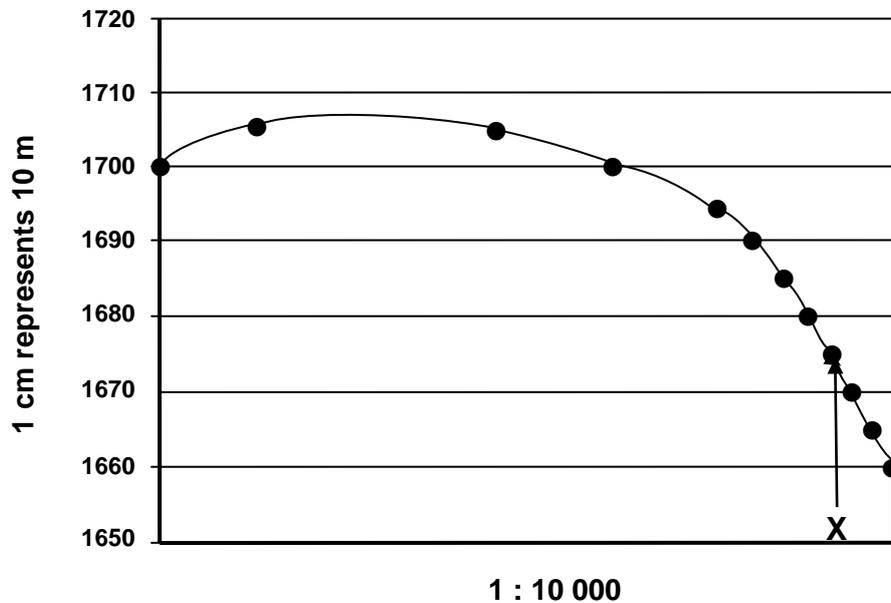   **(Range: 1 : 15.08 to 1 : 15.69)**

(5 x 1)   (5)

2.2   Refer to the cross section of the feature labelled Blokhuis **(4)** on the orthophoto map below and answer the questions that follow.

1 : 10 000

2.2.1   Calculate the vertical exaggeration for the cross-section marked **2-3** on the orthophoto map.

VS = 10 x 100
*   = 1 000* ✓

HS = 1 : 10 000 ✓

VE = VS ✓
*   HS*
*   =   1   x   10 000* ✓
*   1000   1*
*   = 10 times* ✓   (5 x 1)   (5)

2.2.2   Why is it necessary to exaggerate a cross section vertically?

In order to see the shape of the landform – if not exaggerated the cross section will appear as a flat line ✓
[Concept]   (1 x 1)   (1)

2.2.3   Identify the feature labelled **X** on the cross section.

Power line ✓   (1 x 1)   (1)

2.3   What is the true bearing of trigonometrical station 299 from spot height 1731
        in block **C9** on the topographical map?

        132˚ ✓

        (Range: 130˚ to 134˚)   (1 x 1)   (1)

2.4   Calculate the area, in square kilometres, of the urban area demarcated by a
        darkened line on the topographical map (blocks **A, B, C/7, 8, 9**).

        Area = length x breadth ✓
        *   = (11,1 cm x 0,5) km x (9,8 cm x 0,5) km*
        *   = 5,55 km* ✓ *x 4,9 km*✓
        *   = 27,19 km²* ✓

        (Range: length = 10,9 cm to 11,3 cm and breadth = 9,6 cm to 10 cm)
        (Answer: 26,1 km² to 28,25 km²)   (4 x 1)   (4)

2.5   Refer to the orthophoto map.

        2.5.1   Was this photograph taken before or after midday (12:00)?

                  Before midday ✓   (1 x 1)   (1)

        2.5.2   Give ONE reason for your answer to QUESTION 2.5.1.

                  Shadows are cast towards the southwest ✓   (1 x 1)   (1)

        2.5.3   The photograph was most likely taken during a very dry period of the
                  year. Explain this statement with reference to block **B7** on the
                  topographical map and the corresponding area on the photograph.

                  *The photograph shows dry land where there is perennial water on the
                  on the topographical map* ✓   (1 x 1)   (1)
                                                                                                 [20]

QUESTION 3: APPLICATION AND INTERPRETATION

3.1   Refer to the industrial area in block **B/C2.**

   3.1.1   Is this likely to be a heavy or a light industrial area? Give a reason for
            your answer.

            Heavy ✓✓
            It is located on the outskirts of the built-up area ✓✓   (2 + 2)   (4)

   3.1.2   Give TWO factors that would have favoured its location in this area.

            Fairly flat land ✓✓
            Availability of land for expansion ✓✓
            Close to the road for transport ✓✓
            Close to the railway line for transport of bulk goods ✓✓
            Close to source of labour supply ✓✓
            Availability of water from nearby rivers ✓✓
            *The population of Harrismith would form part of its market for goods
            produced* ✓✓
            [Any TWO]   (2 x 2)   (4)

3.2   The sewage works is located in block **B6**.

   3.2.1   Name the land-use zone in which the sewage works is located.

            Rural-urban fringe ✓✓   (1 x 2)   (2)

   3.2.2   Comment on the suitability of its location.

            Away from the built-up area ✓✓   (1 x 2)   (2)

3.3   Refer to the farm named Rockydale in block **E10**.

   3.3.1   Identify the type of commercial farming practised at Rockydale.

            Crop farming ✓✓   (1 x 2)   (2)

   3.3.2   Irrigation is important to farming on Rockydale. Name TWO sources of
            water available to them.

            Farm dam✓✓
            Reservoir ✓✓
            River (Black spruit) ✓✓
            [Any TWO]   (2 x 2)   (4)

3.3.3 What is the purpose of the row of trees along the edge of the cultivated land? State TWO purposes.

Windbreak✓✓
To drop the speed of the wind ✓✓
To prevent damage to crops ✓✓
To reduce soil erosion ✓✓
[Any TWO] (2 x 2) (4)

3.4 Refer to street patterns and answer the questions that follow.

3.4.1 Identify the street pattern at Wilgepark.

Planned irregular ✓✓ (1 x 2) (2)

3.4.2 State ONE advantage and ONE disadvantage of the street pattern in Wilgepark.
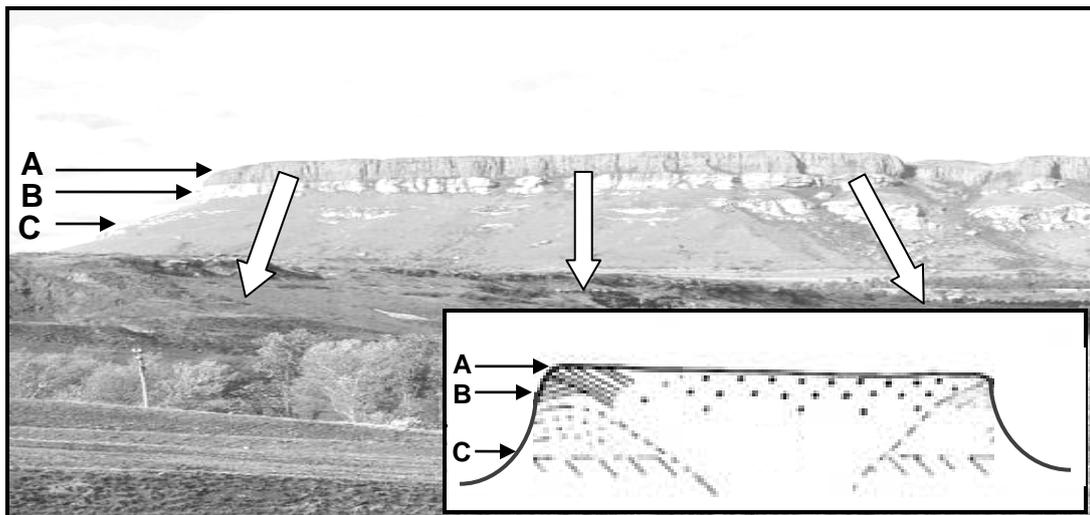
Advantage: Traffic moves fast ✓✓

Disadvantage: Get lost easily ✓✓ (2 x 2) (4)

3.5 Harrismith is situated at the base of Platberg. Study the photograph of Platberg below **(FIGURE 3.5)** as well the area covered in block **A/B12/13** on the topographical map before answering the questions below.

FIGURE 3.5

3.5.1 Identify the slope element labelled **A**.

A *is a crest* ✓✓ (1 x 2) (2)

3.5.2   Explain why Slope **C** can be slippery for hikers.

*It is slippery because loose material from slopes A and B are eroded
and accumulate on it* ✓✓   (1 x 2)   (2)

3.5.3   Sometimes, during winter nights, the temperature drops to below
freezing point in Harrismith. Explain how Platberg possibly influences
the temperature.

The slopes of Platberg will cool in the evening ✓✓
The air in contact with the slopes will also cool ✓✓
Air will become dense and rolls down the slope ✓✓
This cool air will then lowers the temperature of Harrismith ✓✓
[Any TWO]   (2 x 2)   (4)

3.6   Identify the following fluvial features in block **D6**:

3.6.1 **D** *is an ox-bow lake* ✓✓   (1 x 2)   (2)

3.6.2 **E** *is marshes and vlei* ✓✓   (1 x 2)   (2)
                                                                             [40]

QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

4.1   Explain the meaning of the term *spatial data*.

*Spatial data refers to the shape and location of geographic features using
coordinates* ✓✓
[Concept]   (1 x 2)   (2)

4.2   State the spatial data allocated for Harrismith.

29˚00'S ✓ *28˚15'E* ✓   (1 x 2)   (2)

4.3   Study the bar graph **(FIGURE 4.3)** which depicts temperature and rainfall data
       for Harrismith. A statistical analysis of the data on the graph will be useful for
       farmers. The bar graph is an example of attribute data.

FIGURE 4.3

Average temperature and rainfall for Harrismith
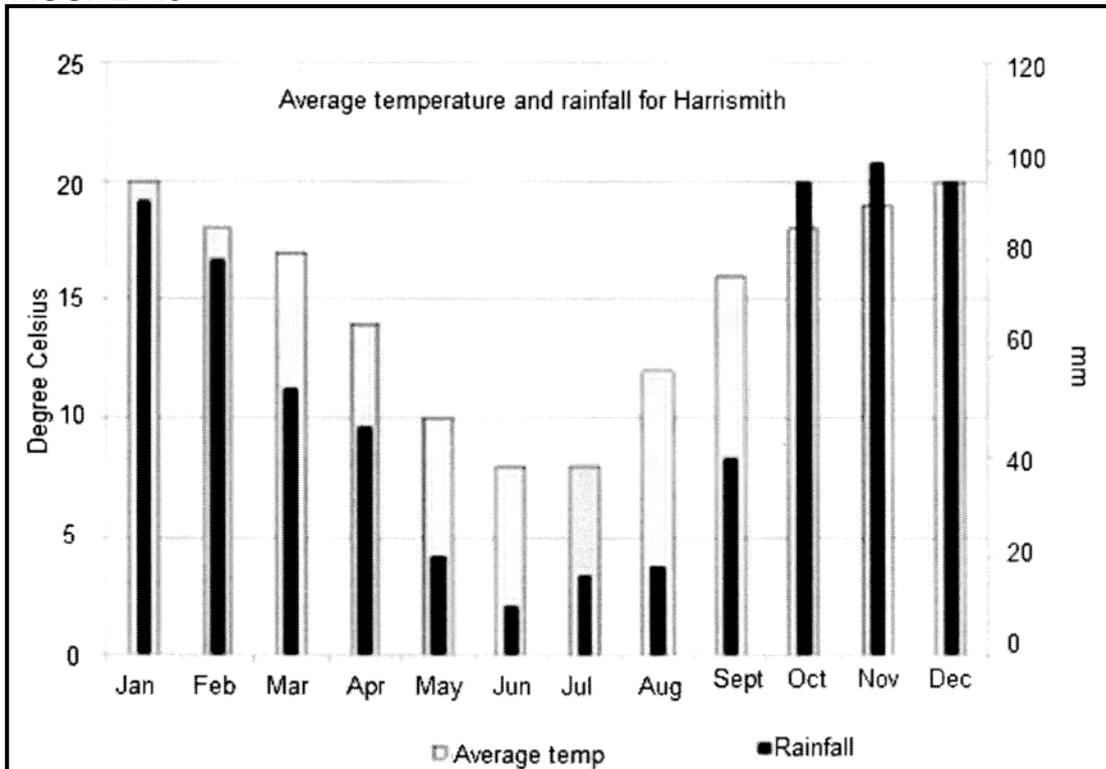
4.3.1   What is *attribute data*?

         *Attribute data refers to the descriptive properties of objects, events
         or features* ✓✓
         [Concept]   (1 x 2)   (2)

4.3.2   Give ONE attribute provided by the bar graph.

         Temperature ✓✓
         Rainfall ✓✓
         [Any ONE]   (1 x 2)   (2)

4.3.3   Explain how you can use the attributes provided by the bar graph.

         To determine the average temperature/rainfall for the year ✓✓
         To determine the maximum temperature/rainfall ✓✓
         To determine the minimum temperature/rainfall ✓✓
         To determine months with high temperature/rainfall ✓✓
         To determine months with low temperature/rainfall ✓✓
         [Any TWO]   (2 x 2)   (4)

4.4   Refer to the orthophoto map which shows a high spatial resolution.

       4.4.1   Explain the term *spatial resolution*.

                *Spatial resolution refers to the degree of detail and clarity of an
                image* ✓✓
                [Concept]   (1 x 2)   (2)

       4.4.2   Why can one say that the orthophoto map has a high spatial
                resolution?

                An orthophoto map has a large scale ✓✓
                It shows more detail ✓✓
                [Any ONE]   (1 x 2)   (2)

4.5   How can GIS assist city planners on where a new shopping centre can be
       built in Harrismith?

       *It can be used to locate the suitable area in which the shopping centre has
       to be built* ✓✓
       *It can be used to determine profitability by looking at the income bracket of
       the people that live in the surrounding area* ✓✓
       It can be used to determine routes to the new shopping centre ✓✓
       [Any TWO. Accept other reasonable answers]   (2 x 2)   (4)
                                                                                          [20]

                                                              TOTAL: 100