basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/
NATIONAL SENIOR CERTIFICATE EXAMINATIONS

GEOGRAPHY P2

2021

MARKS: 75

TIME: 1½ hours

EXAMINATION NUMBER:												
CENTRE NUMBER:												

	M	In	SM	In	DM	In	CM	In	IM	In	MC	EA	EX	RM	In
Q1															
Q2															
Q3															
Q4															
TOT															

**This question paper consists of 16 pages and
1 page for rough work and calculations.**

Please turn over

RESOURCE MATERIAL

1.   An extract from topographic map 3419AC HERMANUS

2.   Orthophoto map 3419 AC 20 HERMANUS

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

INSTRUCTIONS AND INFORMATION

1.   Write your EXAMINATION NUMBER and CENTRE NUMBER 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 (3419AC HERMANUS) and an orthophoto map (3419 AC 20 HERMANUS) 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 end 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 or compass direction in the final answer of calculations, e.g. 10 km; 2,1 cm; west of true north.

8.   You may use a non-programmable calculator.

9.   You may make use of a magnifying glass.

10.   The area demarcated in RED and BLACK on the topographic map represents the area covered by the orthophoto map.

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

ENGLISH	**AFRIKAANS**
Diggings	Uitgrawings
Onrus Mountain	Onrusberge
Golf Course	Gholfbaan
River	Rivier
Sewerage Works	Rioolwerke
Estate	Landgoed
Salt Pan	Soutpan
Nature Reserve	Natuurreservaat

GENERAL INFORMATION ON HERMANUS

Hermanus lies along Walker Bay on the south coast of the Western Cape. It is located about 115 km southeast of Cape Town and is connected to the Mother City by the R43 highway (or the coastal R44 scenic route) and the N2 freeway.

Hermanus has a Mediterranean climate with warm summers. It receives roughly 520 mm of rainfall per annum, the majority of which occurs during the winter months of June to August in the form of frontal precipitation. Summer and winter months are characterised by strong south-easterly and north-westerly winds respectively.

The town of Hermanus occupies a flat plain between the mountains and the sea. Subsequent lowering of the sea level led to the formation of the cliffs which dominate the coastline.

N

■ Hermanus

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

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

The questions below are based on the 1 **:** 50 000 topographic map 3419AC
HERMANUS as well as the orthophoto map 3419 AC 20 HERMANUS 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   Hermanus is situated in …

        A   the Northern Cape.
        B   the Eastern Cape.
        C   the Western Cape.
        D   Gauteng.

1.2   The main type of rainfall received in Hermanus during winter is …

        A   orographic.
        B   convection.
        C   frontal.
        D   advection.

1.3   The way in which height is indicated at 34°19'08"S 19°08'48"E on the
        topographic map is a …

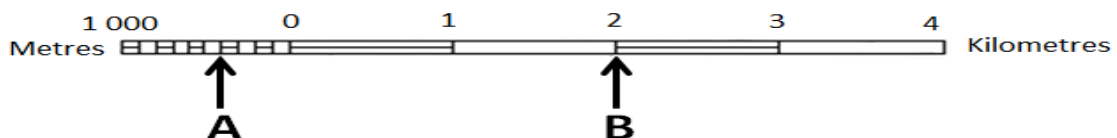   A   contour line.
        B   benchmark.
        C   spot height.
        D   trigonometrical station.

1.4   The general direction of flow of the Leeurivier (river) in block **C9** on the
        topographic map is in a … direction.

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

1.5   The distance from **A** to **B** on the line scale below is … metres.

        A   2 600
        B   2 400
        C   2,6
        D   2,4

1.6   The true bearing from the place of worship **1** to the school **2** on the orthophoto map is …

A   38°
B   55°
C   235°
D   252°

1.7   Man-made feature **3** on the orthophoto map is a …

A   communication tower.
B   windpump.
C   secondary road.
D   monument.

1.8   The orchards and vineyards at **M** in block **C10** on the topographic map are most likely frost resistant, because they are found in/on the …

A   north-facing slope.
B   south-facing slope.
C   valley floor.
D   shadow zone.

1.9   The high-lying area at **N** in block **D7** on the topographic map is a/an …

A   confluence.
B   interfluve.
C   tributary.
D   watershed.
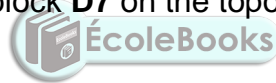
1.10   The main characteristic of the streams in block **D8** on the topographic map:

A   Erosion dominates
B   Water flows in sheets
C   Deposition dominates
D   Wider channels are found

1.11   The dominant stream pattern in block **H8** on the topographic map is …

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

1.12   The main activity that causes an environmental injustice in block **B5** on the topographic map is …

A   farming.
B   fishing.
C   hiking.
D   excavating.

1.13   The main factor that influenced the dispersed pattern of the settlement at **4** on the orthophoto map is the …

        A   gradient.
        B   protected area.
        C   bridge.
        D   other road.

1.14   The physical (natural) features responsible for the linear shape of the built-up areas in blocks **J10**, **K9** and **K10** on the topographic map is due to the ...

        A   arterial route and power line.
        B   coastal rocks and mountain.
        C   arterial route and mountain.
        D   power line and mountain.

1.15   New Harbour at **5** on the orthophoto map is an example of a … economic activity.

        A   primary
        B   secondary
        C   tertiary
        D   quaternary

                                                                        (15 x 1)   **[15]**

QUESTION 2: MAP CALCULATIONS AND TECHNIQUES

2.1 Refer to the topographic map.

Calculate the magnetic declination for 2021. Show ALL calculations. Marks will be awarded for calculations. Clearly indicate the direction in relation to true north in the final answer.

Difference in years: _____

Mean annual change: _____

Total annual change: _____

Mean magnetic declination for 2021: _____

_____

_____

(5 x 1) (5)

2.2 Refer to the topographic map.

2.2.1 Calculate the average gradient from trigonometrical station 31 (**O**) in block **I4** to benchmark 36.4 (**P**) in block **J5**. Show ALL calculations. Marks will be awarded for calculations.

Formula: **Average gradient** $= \dfrac{\textbf{vertical interval (VI)}}{\textbf{horizontal equivalent (HE)}}$

_____

_____

_____

_____

_____

_____

(5 x 1) (5)

2.2.2   (a)   Why did the gradient calculated in QUESTION 2.2.1 limit the construction of a road between **O** (in block I**4**) and **P** (in block **J5**) on the topographic map?

_____

_____
                                                                                    (1 x 1)   (1)

(b)   How did engineers construct the R43 from block I**4** to block **J5** to overcome the challenge in your answer to QUESTION 2.2.2(a)?

_____

_____
                                                                                    (1 x 1)   (1)

2.3 The block below consists of a vertical and horizontal scale, as well as the heights of the contour lines from **6** to **7** found on the orthophoto map.

Use the block below for ALL answers to QUESTION 2.3.1.

Horizontal scale: 1 : 10 000
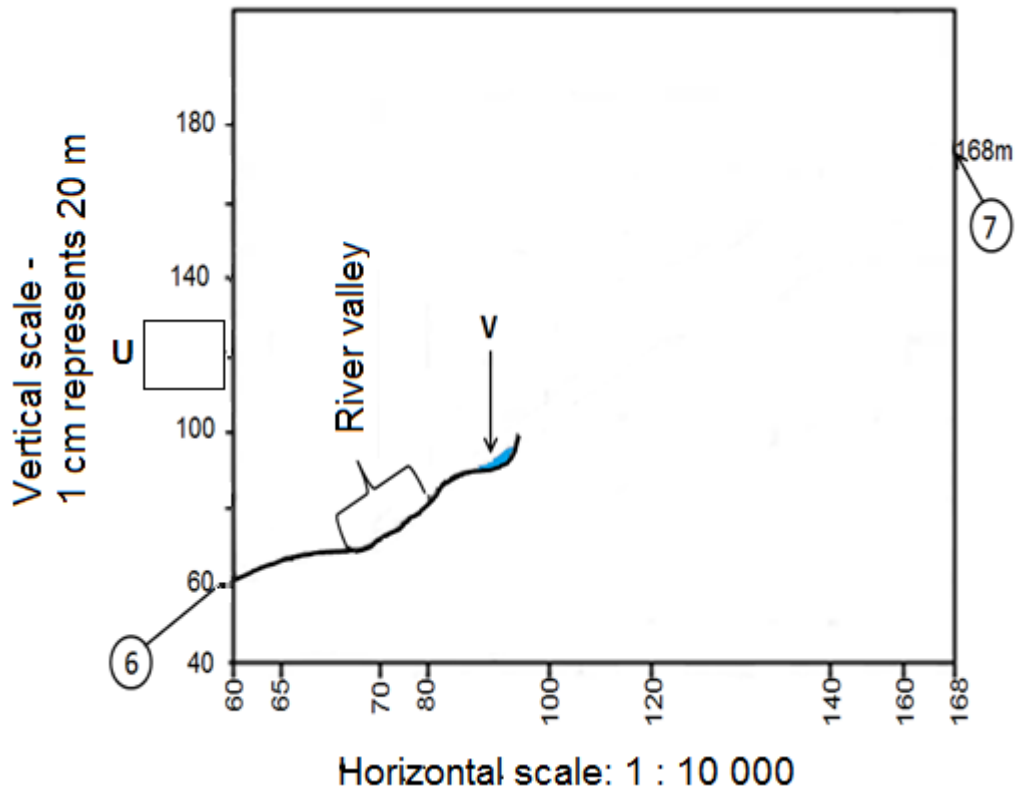
2.3.1 (a) Indicate the height of **U** on the vertical scale of the above cross-section. (1 x 1) (1)

(b) Complete the above cross-section which represents an area from **6** to **7** on the orthophoto map, by using the given contour heights on the horizontal scale. (2 x 1) (2)

(c) Identify man-made feature **V** on the cross-section. (1 x 1) (1)

2.3.2   Calculate the vertical exaggeration of the cross-section drawn in QUESTION 2.3.1(b). Show ALL calculations. Marks will be awarded for calculations. Clearly indicate the unit of measurement in the final answer.

Formula: **Vertical exaggeration** $= \dfrac{\textbf{vertical scale (VS)}}{\textbf{horizontal scale (HS)}}$

_____

_____

_____

_____

_____
                                                                              (4 x 1)   (4)
                                                                                        [20]

QUESTION 3: APPLICATION AND INTERPRETATION

3.1   Refer to the topographic map.

   3.1.1   Does the mapped area generally receive seasonal or annual rainfall?

   Answer: _____

   (1 x 1)   (1)

   3.1.2   Give TWO pieces of evidence from the topographic map to support the answer to QUESTION 3.1.1.

   _____

   _____

   (2 x 1)   (2)

3.2   Refer to the topographic map.

   Hermanus is located between the ocean and a high-lying area (mountain). A southerly wind blows during the day.

   3.2.1   Is the southerly wind offshore or onshore?

   Answer: _____

   (1 x 1)   (1)

   3.2.2   Explain your answer to QUESTION 3.2.1.

   _____

   _____

   (1 x 2)   (2)

3.3   Refer to the Botrivier (river) from block **C6** to block **D4** on the topographic map.

    3.3.1   In which stage (course) of development is the Botrivier (river)?

    _____

                                                            (1 x 1)   (1)

    3.3.2   Give ONE piece of evidence from the topographic map to support your answer to QUESTION 3.3.1.

    _____

    _____

    _____

                                                            (1 x 2)   (2)

    3.3.3   How did the geomorphological process in this stage (course) of the river influence the crop farming in the area?

    _____

    _____

                                                            (2 x 2)   (4)

3.4   Refer to the land-use zone between Hawston and Fisherhaven in blocks **H3** and **H4** on the topographic map.

    3.4.1   Identify the land-use zone between Hawston and Fisherhaven in blocks **H3** and **H4** on the topographic map.

    _____

                                                            (1 x 1)   (1)

    3.4.2   Give ONE piece of map evidence to support your answer to QUESTION 3.4.1.

    _____

    _____

                                                            (1 x 2)   (2)

3.5   Refer to **9** on the orthophoto map.

      3.5.1   Identify the street plan (pattern) at **9**.

      _____

                        (1 x 1)   (1)

      3.5.2   State ONE advantage of the street plan (pattern) at **9**.

      _____

      _____

                        (1 x 1)   (1)

      3.5.3   How did the street plan (pattern) at **9** develop?

      _____

      _____

                        (1 x 2)   (2)

3.6   Refer to **10** on the orthophoto map, which is an industrial area.

      3.6.1   Are the industries heavy or light industries?

      Answer: _____

                        (1 x 1)   (1)

      3.6.2   Discuss why the industries identified in QUESTION 3.6.1 are in a suitable location.

      _____

      _____

      _____

      _____

                        (2 x 2)   (4)
                                  [25]

QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

4.1   The following information on the Klei Dam at **Q** (block **G8**) on the topographic map is provided:

Location: 34°21'45"S 19°12'45"E
Depth: 10 m

      4.1.1   Is the Klei Dam at **Q** in block **G8** a point, line or polygon feature?

               Answer: _____
                                                               (1 x 1)   (1)

      4.1.2   State whether the following are *spatial data* or *attribute data*:

               (a)   The depth of the Klei Dam at **Q**

                    _____
                                                             (1 x 1)   (1)

               (b)   The location of the Klei Dam at **Q**

                    _____
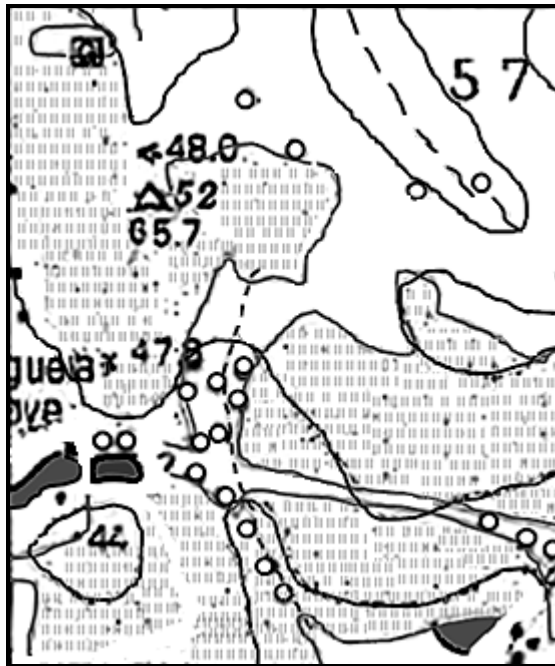   (1 x 1)   (1)

      4.1.3   Explain the importance of determining the depth of the Klei Dam at **Q** for farming activities in the area.

               _____

               _____
                                                                (1 x 2)   (2)

4.2   Refer to the enlarged insert of block **F4** from the topographic map, showing a combination of different data layers.

4.2.1   What is a *data layer*?

        _____

                                                                (1 x 1)   (1)

4.2.2   Use the topographic map and identify the data layer that has been omitted (left out) from the insert.

        _____

                                                                (1 x 1)   (1)

4.2.3   What is the importance of the data layer identified in QUESTION 4.2.2 to the economic development of the farming community in block **F4**?

        _____

        _____

                                                                (2 x 2)   (4)

4.3   Refer to blocks **D4** and **D5** on the topographic map. The quality of water in the identified blocks could be affected by human activities. How would a GIS specialist use data querying to evaluate the quality of water in this area?

_____

_____

_____

_____

                                                                    (2 x 2)   (4)
                                                                                 [15]

                                                        TOTAL: 75

ROUGH WORK AND CALCULATIONS

(NOTE: Do NOT detach this page from the question paper.)