basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

GEOGRAPHY P2

EXEMPLAR 2014

MEMORANDUM

MARKS: 75

This memorandum consists of 12 pages.

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RESOURCE MATERIAL

1. An extract from topographical map 3424BB HUMANSDORP

2. Orthophoto map 3424BB 1 HUMANSDORP

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

INSTRUCTIONS AND INFORMATION

1. Write your name and class/grade in the spaces 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 3424BB of HUMANSDORP and an orthophoto map of a part of the mapped area.

4. You must hand 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 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. You may use a non-programmable calculator.

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

ENGLISH	**AFRIKAANS**
Brick works	Steenmakery
Caravan park	Karavaanpark
Diggings	Uitgrawings
Golf course	Gholfbaan
River	Rivier
River mouth	Riviermond
Sewage works	Rioolwerke
Wetland	Vlei

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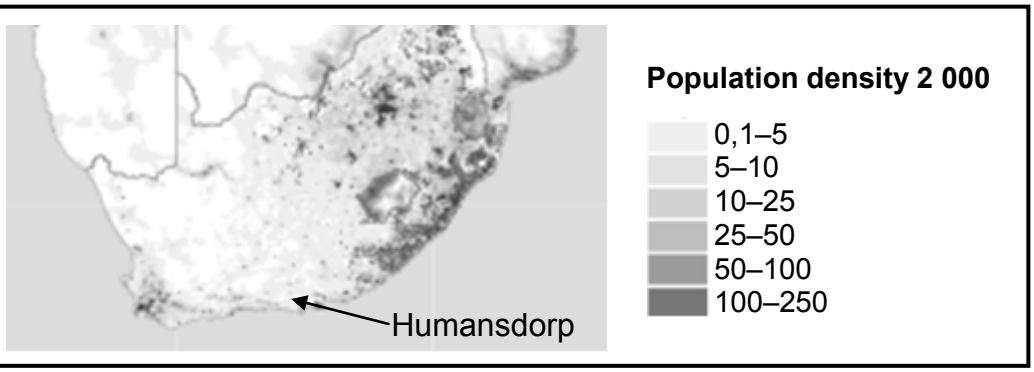
GENERAL INFORMATION ON HUMANSDORP

Humansdorp is a small town in the Eastern Cape with a population of around 35 000. This town is the centre of the Cacadu municipal district's industry and farming. It is also considered the gateway to the coastal town of Jeffreys Bay, which is 16 kilometres away. Humansdorp is a 50-minute drive away from Port Elizabeth. It is eco-friendly and maintains its small-town charm with various hiking trails and forest walks.

FIGURE 1



QUESTION 1: MULTIPLE-CHOICE QUESTIONS

The questions below are based on the 1 : 50 000 topographical map 3424BB HUMANSDORP, 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 the question.

1.1 The scale of the topographical map is … than the scale of the orthophoto map.

A 10 times larger
B 5 times larger
C 5 times smaller
D 10 times smaller

C

1.2 The town of Jeffreys Bay is a/an …

A recreational town.
B industrial town.
C educational town.
D gap town.

A

1.3 The shape of the town of Humansdorp is …

A circular.
B linear.
C T-shaped.
D Y-shaped.

B

1.4 Wavecrest in block **B11** has a/an ... street pattern.

A grid
B planned irregular
C radial
D unplanned irregular

B

1.5 The major primary activity visible in the mapped area is …

A fishing.
B mining.
C forestry.
D crop farming.

D

1.6 The general flow direction of the river in block **D8** on the topographical map is ...

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

A

1.7 Primary activities are limited at **X** owing to ...

A a lack of transport.
B non-perennial streams.
C marshes.
D distance from markets.

C

1.8 The feature found at **P** in block **B11** is a …

A sand island.
B sandy beach.
C bay.
D coastal rock.

D

1.9 The province that Humansdorp is located in is (the) …

A Western Cape.
B Eastern Cape.
C KwaZulu-Natal.
D North West.

B

1.10 The feature labelled **1** on the orthophoto map is …

A diggings.
B a dry pan.
C perennial water.
D sewage works.

C

1.11 The slope formed between **5** and **6** on the orthophoto map is a/an … slope.

A concave
B terraced
C convex
D even

A

1.12 The natural feature marked **5–6** on the orthophoto map is a …

A saddle.
B hill.
C ridge.
D valley.

C

1.13 The index number of the map sheet northeast of Humansdorp is …

A 3424BB.
B 3324DC.
C 3424DD.
D 3325CC.

D

1.14 The grid reference/coordinates/position of trigonometrical station 140 in block **B3** is …

A 34°01'20"S 24°47'44"E/34°01,3S 24°47,7E.
B 34°02'40"S 24°48'16"E/34°02,7S 24°48,3E.
C 34°01'20"E 24°47'44"S/34°01,3E 24°47,7S.
D 34°02'40"E 24°48'16"S/34°02,7E 24°48,3S.

A

1.15 The city/town located 68 km from the mapped area is …

A Clarkson.
B Port Elizabeth.
C Hankey.
D Plettenberg Bay.

B

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

QUESTION 2: MAP CALCULATIONS AND TECHNIQUES

2.1 Calculate the straight-line distance, in kilometres, between trigonometrical station 294 in block **F1** and trigonometrical station 94 in block **E1**. Show ALL calculations.

Actual Distance = Map Distance x Map Scale
= 4,8 cm ✓ x 0,5 km ✓
= 2,4 km ✓
Range [2,3 km to 2,5 km] (3 x 1) (3)

2.2 Determine the present magnetic bearing of trigonometrical station 290 in block **F8** from trigonometrical station 292 in block **D9**.

Formula: Present magnetic bearing = true bearing + present magnetic declination

True bearing = 203° (201° – 205°) ✓
Difference in years = 2014 – 2001
= 13 years ✓
Mean annual change = 9'W
Total change = 13 x 9'W
= 117'W
= 1°57'W ✓
Magnetic declination in 2014 = 25°29'W +1°57'W ✓
= 26°86'W
= 27°26'W ✓
Magnetic bearing = 203° + 27°26'
= 230°26' ✓
Range [228°26' to 232°26'] (6 x 1) (6)

2.3 Calculate the average gradient between trigonometrical station 290 in block **F8** and trigonometrical station 292 in block **D9**. Show ALL calculations.

Formula: $\textbf{Gradient} = \frac{\textbf{vertical interval}}{\textbf{horisontal equivalent}}$

VI = 47,3 m – 26,5 m ✓
= 20,8 m ✓

HE $= \frac{5{,}9\text{ cm} \checkmark \times 500\text{ m}}{100}$
= 2 950 m ✓

Gradient $= \frac{20{,}8}{2\,950}$ ✓
$= \frac{1}{141{,}8}$
= 1:141,8 ✓
Range [1:139 to 1:144,2]

OR

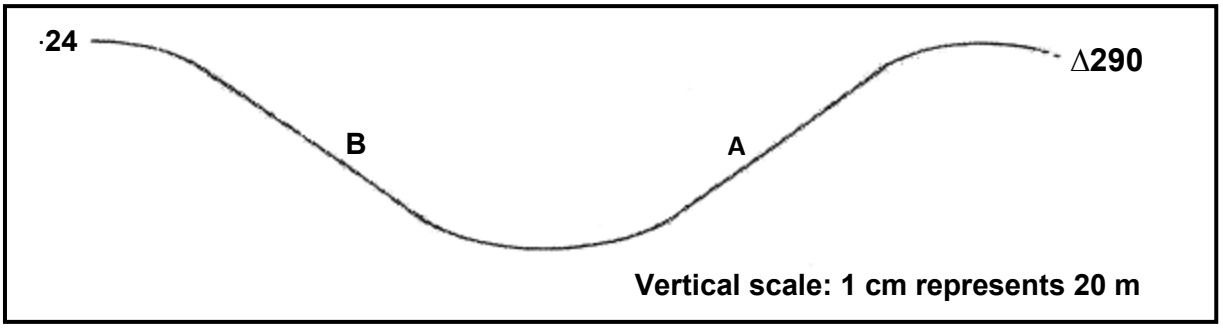
VI = 47,3 m – 26,5 m ✓
= 20,8 m ✓

HE $= \frac{5{,}9\text{ cm} \checkmark \times 10\,000\text{ cm}}{100}$
= 2 950 m ✓

Gradient $= \frac{20{,}8}{2\,950}$ ✓
$= \frac{1}{141{,}8}$
= 1:141,8 ✓

(6 x 1) (6)

2.4 Refer to the cross-section from spot height 24 in block **F7** to trigonometrical station number 290 in block **F8** below and answer the questions that follow.



2.4.1 If you stand at **A**, will you be able to see a person at **B**?

Yes ✓ (1 x 1) (1)

2.4.2 Give ONE reason for your answer to QUESTION 2.4.1.

No obstructions/high lying areas between the two points. ✓
[Concept] (1 x 1) (1)

2.4.3 Calculate the vertical exaggeration of the cross-section. Show ALL calculations.

Formula: $\textbf{Vertical exaggeration} = \frac{\textbf{vertical scale}}{\textbf{horisontal scale}}$

Vertical Exaggeration = $\frac{\textit{Vertical Scale}}{\textit{Horizontal Scale}}$

= $\frac{\textit{1:2 000}}{\textit{1:50 000}}$ ✓

= $\frac{1}{2\,000} \times \frac{50\,000}{1}$ ✓

= $\frac{25}{1}$

= *25 times* ✓ (3 x 1) (3)

[20]

QUESTION 3: APPLICATION AND INTERPRETATION

3.1 Refer to points **3** and **4** on the orthophoto map.

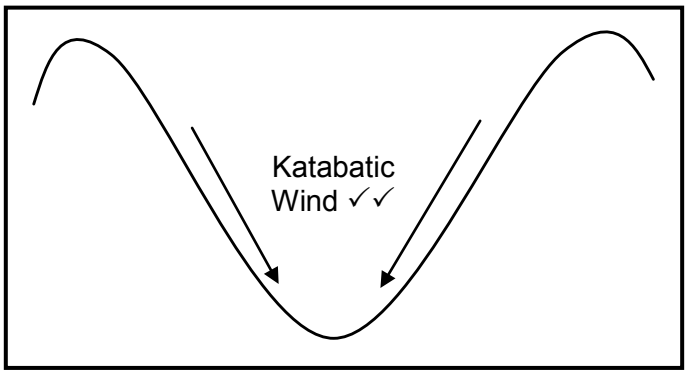
3.1.1 Name the landform that is found between points **3** and **4** on the orthophoto map.

(River) valley ✓ (1 x 1) (1)

3.1.2 Name the type of wind that will occur at this landform during the night.

Katabatic/downslope/mountain breeze ✓✓ (1 x 2) (2)

3.1.3 Draw a simple, labelled free-hand cross-section to show the wind identified in QUESTION 3.1.2.



(1 x 2) (2)

3.2 In which stage of development is Krom River in block **I5**? Give a reason for your answer.

Stage: *Plain stage/old age stage/lower course* ✓

Reason: *There are braided streams* ✓✓
Wide flood plain ✓✓
It is next to the ocean ✓✓
[Any ONE] (1 + 2) (3)

3.3 Give a possible explanation why so many marshes developed in the mapped area.

Area flat/gentle slope ✓✓
Water does not drain away easily ✓✓
Soil is saturated/waterlogged ✓✓
[Any ONE. Accept other suitable explanation] (1 x 2) (2)

3.4 Study the table below showing the average annual midday temperatures for areas **5** and **11** on the orthophoto map and answer the question that follows.

Area **11**	Area **5**
24,5 °C	19 °C

Area **11** has a higher average temperature than area **5**. Give ONE possible reason for this difference in temperature.

*Area **11** is an urban area and area **5** is a rural area* ✓✓
*Area **11** is made up of artificial surfaces (concrete, steel, tar) and area **5** of vegetation* ✓✓
*Natural processes e.g. evapotranspiration occurs at **5**, but are limited at **11*** ✓✓
*More pollution at **11** to trap heat than at **5*** ✓✓
*More artificial heating at **11** than at **5*** ✓✓
[Any ONE- Accept other answers related to urban heat islands] (1 x 2) (2)

3.5 Find residential zone **12** on the orthophoto map. Also refer to the topographical map. Is residential area **12** a high- or low-income residential area? Give a reason for your answer.

Income area: *Low-income residential area* ✓

Reason: *It has small plots* ✓✓
It has high density housing ✓✓
[Any ONE. Accept other suitable reasons] (1 + 2) (3)

3.6 State whether zone **10** on the orthophoto map is a light or heavy industrial area. Give a reason for your answer.

Type of industrial area: *Heavy industry* ✓

Reason: *It is found on the outskirts of town* ✓✓
Flat land ✓✓
Space for expansion ✓✓
[Any ONE. Accept other suitable reasons] (1 + 2) (3)

3.7 Jeffreys Bay has a roughly linear shape. Explain why this is the case.

Follows the shape of the coastline ✓✓
Suburbs develop as close as possible to the coastline ✓✓
Residents prefer a sea view ✓✓
Settlement wants to take advantage of the cooling effect of the sea breeze ✓✓
[Any TWO] (2 x 2) (4)

3.8 Refer to FIGURE 1 on page 3. Is FIGURE 1 a political or thematic map? Give a reason for your answer.

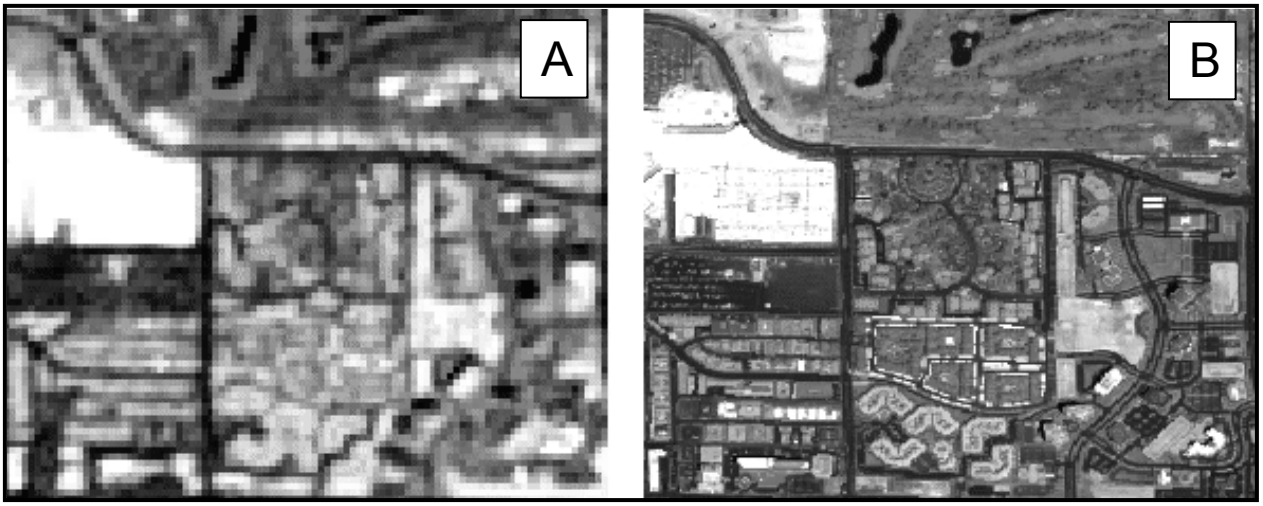
Type of map: *Thematic map* ✓

Reason: *Focuses on a specific theme and that is population density* ✓✓
[Concept] (1 + 2) (3)

[25]

QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

4.1 Refer to the images below illustrating spatial resolution and answer the questions that follow.



4.1.1 Define the term *spatial resolution*.

It describes the amount of detail shown by a map or image ✓
[Concept] (1 x 1) (1)

4.1.2 Which image, **A** or **B**, has a better spatial resolution? Give a reason for your answer.

Image: ***B*** ✓

Reason: *It has smaller and more pixels* ✓✓
It has more detail ✓✓
[Any ONE reason] (1 + 2) (3)

4.2 Buffering plays an important role in flood prevention at Kleinriviermond (Klein River mouth) in block **I6**.

4.2.1 Define the term *buffering*.

A line used to demarcate an area around a spatial feature ✓
[Concept] (1 x 1) (1)

4.2.2 You want to build a holiday resort near Kromriviermond (Krom River mouth), but you are concerned about the Krom River flooding. Explain how you could use buffering to assist you with this problem.

One could use buffering to demarcate the area around the river where flooding could occur and build outside this area ✓✓ (1 x 2) (2)

4.3 Refer to block **E7** on the topographical map.

4.3.1 Identify the following in block **E7**:

(a) A point feature: *Reservoir* ✓
Windmill ✓
[Any ONE] (1 x 1) (1)

(b) A line feature: *Secondary road* ✓
Other road ✓
River/stream ✓
Dam wall ✓
Contour line ✓
[Any ONE] (1 x 1) (1)

(c) An area/polygon feature: *Dam* ✓
Perennial water ✓
Non-perennial water ✓
[Any ONE] (1 x 1) (1)

4.4 You are asked to do a paper GIS to determine the accessibility of Humansdorp. Name the main data layer you would use in your investigation and give a reason for your answer.

Main layer: *Transport/roads* ✓

Reason: *Accessibility determined by transport infrastructure as transport networks are needed to reach Humansdorp* ✓✓
[Concept] (1 + 2) (3)

4.5 Explain why data manipulation is important in a GIS.

Data manipulation involves getting the different data sources into a format that can be integrated ✓✓
When all the data layers are in similar data files the data can be integrated (put together) ✓✓
Statistical information must be manipulated into such a file format that it can be used in the GIS software and linked to specific spatial features ✓✓
Errors in the database can be eliminated during manipulation ✓✓
[Any ONE. Concept] (1 x 2) (2)

TOTAL: 75

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