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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

GEOGRAPHY P2

NOVEMBER 2011

POSSIBLE ANSWERS

MARKS: 100

EXAMINATION NUMBER														
CENTRE NUMBER														

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.

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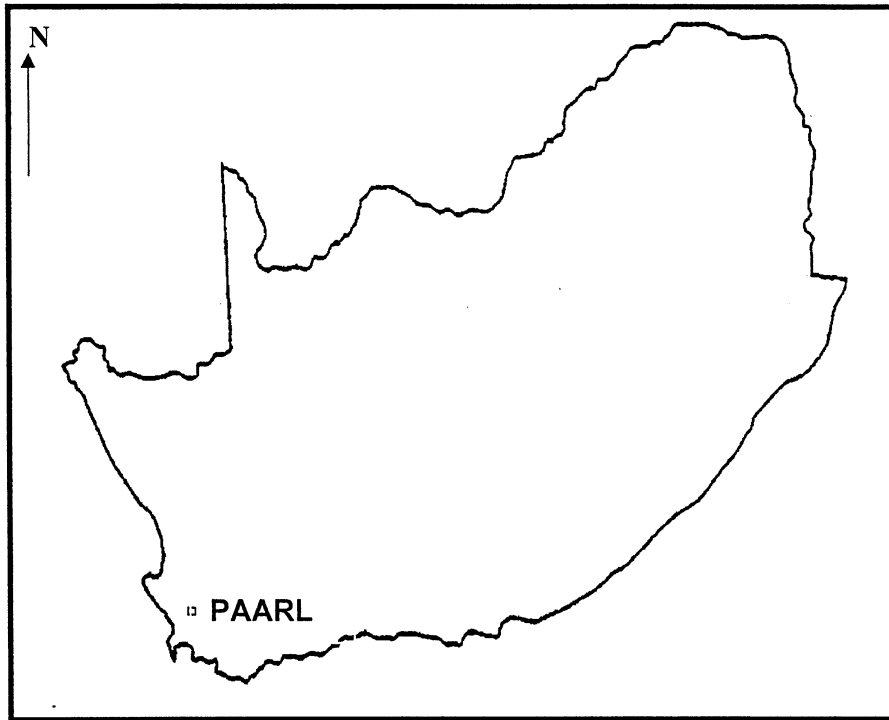
RESOURCE MATERIAL

1. An extract from topographical map 3318DB PAARL.
2. Orthophoto map 3318DB 25 PAARL.
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 3318DB PAARL 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. Marks will be allocated for calculations and formulae.
7. You may use a non-programmable calculator.

POSITION OF PAARL WITHIN SOUTH AFRICA



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

ENGLISH

Dipping tanks
Firebreaks
Landing strip
Stadium
Station
Sports club

AFRIKAANS

Dipbakke
Voorbrande
Landingstrook
Stadion
Stasie
Sportklub

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

The questions below are based on the 1:50 000 topographical map 3318DB PAARL, as well as the orthophoto map 3318DB 25 PAARL as 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 index of the map sheet directly southeast of PAARL is ...

- A 3319AC.
- B 3318DC.
- C 3319CC.
- D 3318BC.

C

1.2 The Earth's curved surface is represented on the topographical map by the ... projection.

- A Transversal
- B Lambert
- C Mercator
- D Gauss conform

D

1.3 Paarl is located in the ...

- A Western Cape.
- B Northern Cape.
- C Eastern Cape.
- D Free State.

A

1.4 The approximate time that the orthophoto was taken would be ...

- A between 08:00–10:00.
- B between 10:00–12:00.
- C between 12:00–14:00.
- D exactly at 12:00.

C

1.5 The stream channel feature in block **D12** on the topographical map is a/an ...

- A oxbow lake.
- B braided stream.
- C meander.
- D dendritic pattern.

B/C

1.6 The man-made water feature at 33°38'24"S18°52'48"E/33°38,4'S18°52,8'E is a ...

- A dam.
- B non-perennial river.
- C river.
- D windmill.

D

1.7 The drainage pattern in blocks F8, G8 and H8 is ...

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

B/D

1.8 The land-use zone marked 1 on the orthophoto map is ...

- A the zone of decay.
- B the rural-urban fringe.
- C a high income residential area.
- D an industrial zone.

B

1.9 The slope marked 2 on the orthophoto map is ...

- A steep.
- B gentle.
- C concave.
- D convex.

C

1.10 The building marked 3 on the orthophoto map is a ...

- A school.
- B factory.
- C silo.
- D smallholding.

A

(10 x 2)

[20]

QUESTION 2: GEOGRAPHICAL TECHNIQUES AND CALCULATIONS

2.1 Calculate the gradient between trigonometrical station 172 in block **C8** and spot height 162 in block **B9**. Show ALL calculations. Marks will be allocated for calculations.

$$\text{Gradient} = \frac{VI \sqrt{}}{HE}$$

$$VI = 173,6 - 162 \\ = 11,6 \text{ m}\sqrt{}$$

OR

$$\text{Gradient} = \frac{VI \sqrt{}}{HE}$$

$$VI = 173,6 - 162 \\ = 11,6 \text{ m}\sqrt{}$$

$$HE = 52 \text{ mm}\sqrt{} \times 50\,000 \\ = 2\,600 \text{ m}\sqrt{}$$

$$HE = 5,2 \text{ cm}\sqrt{} \times 500 \\ = 2\,600 \text{ m}\sqrt{}$$

$$\frac{VI}{HE} = \frac{11,6}{2\,600\sqrt{}}$$

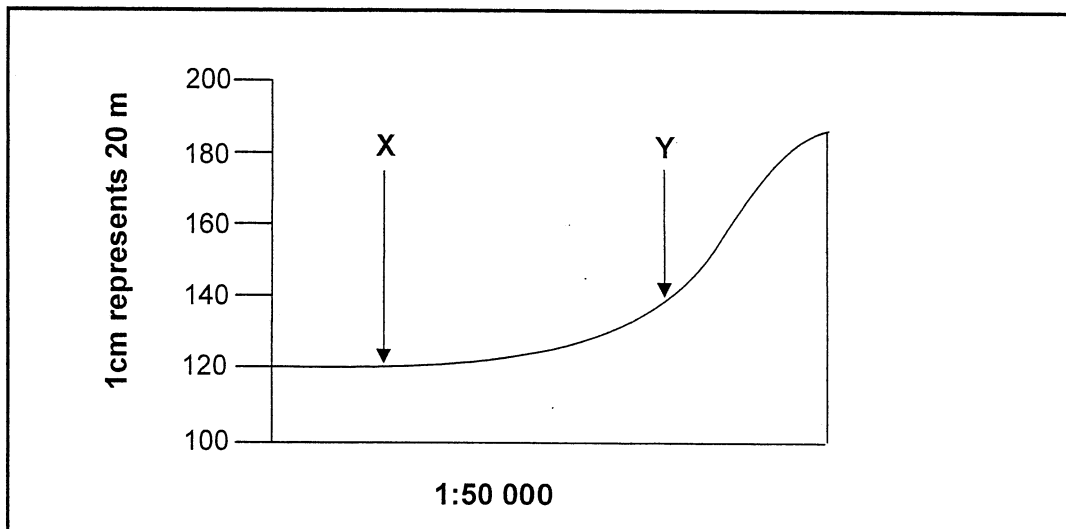
$$\frac{VI}{HE} = \frac{11,6}{2\,600\sqrt{}}$$

$$1 : 224,13\sqrt{} \\ \text{(Range: 215.51 to 232.75)}$$

$$1 : 224,13\sqrt{} \\ \text{(Range: 215.51 to 232.75)}$$

(6)

- 2.2 The following is a cross section from the windmill (block E4) to trigonometrical station 184 (block E6).



- 2.2.1 Calculate the vertical exaggeration of the cross section above.

$$VS = 1 \text{ cm to } 20 \text{ m} \\ = 1 : 2\,000 \checkmark$$

$$HS = 1 : 50\,000 \checkmark$$

$$VE = \frac{VS}{HS} \checkmark$$

$$VE = \frac{1}{2\,000} \times \frac{50\,000}{1} \\ = 25 \text{ times } \checkmark \text{ (Give full marks for the answer)} \quad (4)$$

- 2.2.2 Identify the features labelled X and Y on the cross section.

X: other road / dirt (gravel) road / cultivated land \checkmark

Y: power line / cultivated land / farm boundary \checkmark (2)

- 2.2.3 Why are cross sections exaggerated?

To see the difference in height \checkmark
[Concept]

(1)

- 2.3 Calculate the magnetic declination for the year 2011. Show ALL calculations. Marks will be allocated for calculations.

$$\begin{aligned} \text{Difference in years} &= 2011 - 2002 \\ &= 9 \text{ years} \checkmark \times 6' W \checkmark \\ &= 54' W \checkmark \end{aligned}$$

$$\begin{aligned} \text{Magnetic declination in 2011} &= 23^{\circ}33' + \checkmark 54' W \\ &= 23^{\circ}87' W \\ &= 24^{\circ}27' W \checkmark \end{aligned} \quad (5)$$

- 2.4 Give TWO reasons why the magnetic declination will be useful to a person using a map on a field trip.

It will allow the map to be set for accurate orientation \checkmark
It determines true north \checkmark
To calculate magnetic bearing \checkmark
Reaching a destination using a compass \checkmark
 [Any TWO]

(2)
[20]

QUESTION 3: APPLICATION OF THEORY/MAP AND PHOTO INTERPRETATION

- 3.1 Refer to both the topographical map and the orthophoto map when answering the questions below.

- 3.1.1 Identify the shape of the town Paarl.

Linear $\checkmark\checkmark$
Elongated $\checkmark\checkmark$
 [Any ONE] (1 x 2) (2)

- 3.1.2 Name TWO physical factors that determine the shape of the town Paarl.

The town developed along the river / berg river $\checkmark\checkmark$
The town developed along the mountain range / next to a steep slope $\checkmark\checkmark$
Follows a valley $\checkmark\checkmark$
 [Any TWO] (2 x 2) (4)

- 3.2 What is the direction of Boland Agricultural College in block C7 from Paarl?

NW / WNW $\checkmark\checkmark$ (1 x 2) (2)

- 3.3 Compare Dal Josafat (block F12) and Noorder-Paarl (block F11) in terms of the following:

	DAL JOSAFAT	NOORDER-PAARL
3.3.1 Main land-use zone	<i>Industrial / factories</i> \checkmark	<i>Residential / houses suburbs</i> \checkmark
3.3.2 Land value	<i>Low / cheap</i> \checkmark	<i>High / expensive</i> \checkmark
3.3.3 Degree of pollution	<i>High / more</i> \checkmark	<i>Low / less</i> \checkmark (3 x 2)

(6)

3.4 Refer to Groenheuwel in block **E/F13** on the topographical map and marked **4** on the orthophoto map.

3.4.1 Identify the street pattern at Groenheuwel.

Planned irregular ✓✓ (1 x 2) (2)

3.4.2 Name ONE advantage and ONE disadvantage of the street pattern identified in QUESTION 3.4.1.

Advantage: *Free flow of traffic / less traffic jams* ✓✓

More scenic / aesthetic / not boring ✓✓

Follows contours ✓✓

Saves petrol ✓✓

Saves time ✓✓

[Any ONE]

Disadvantage: *Get lost easily* ✓✓

Lost people will be vulnerable to crime ✓✓

Difficult to develop infrastructure ✓✓

Difficult to expand / layout ✓✓

Many cul-de-sacs ✓✓

[Any ONE]

(2 x 2) (4)

3.4.3 The area Groenheuwel (marked **4**) on the orthophoto map is a low income residential area. Give TWO pieces of evidence from the orthophoto map to prove this statement.

Small stands ✓✓

Small houses ✓✓

Houses are of the same style / shape / design ✓✓

Close to the industries ✓✓

No vegetation / few trees ✓✓

High density / clustered ✓✓

Many foot paths leading to surrounding areas ✓✓

[Any TWO]

(2 x 2) (4)

3.5 Paarlberg in block **F/G/H 8/9/10** is an example of a volcanic intrusive landform exposed above the Earth's surface after erosion. Refer to both the topographical map and orthophoto map when answering the questions that follow.

3.5.1 State the rock type that results from volcanism before it has been exposed above the Earth's surface.

Igneous / Granite ✓✓ (1 x 2) (2)

3.5.2 Identify the landform referred to after it has been exposed above the Earth's surface.

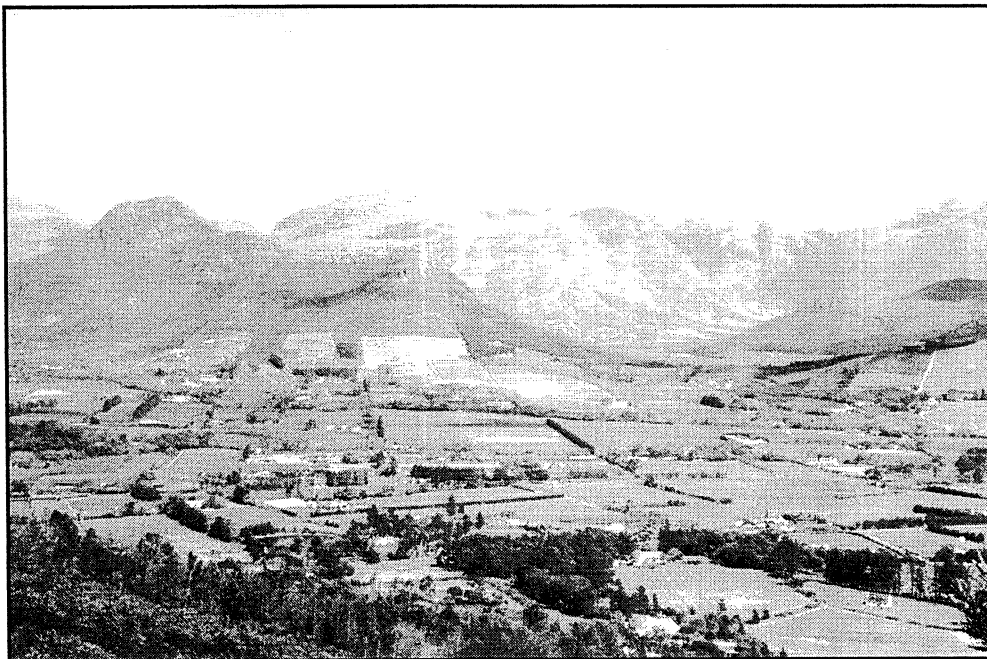
Dome / bornhardt / ruwari ✓✓ (1 x 2) (2)

3.5.3 Of what potential value is the Paarlberg feature likely to be to the economy of Paarl?

Tourism / nature reserve √√
Abseiling √√
Future mining √√
Farming when it weathers √√
Provide building material √√
Water supply √√
Recreation √√
Job creation √√
[Any ONE]

(1 x 2) (2)

3.6 Study the photograph of the Paarl Valley below, as well as on the topographical map (block F12).



3.6.1 What type of photograph is the photograph of the Paarl Valley?

Horizontal / High oblique √√ (1 x 2) (2)

3.6.2 Identify the slope wind that people in the valley are likely to experience in the evenings in winter.

Katabatic / downslope / gravitational wind √√ (1 x 2) (2)

3.6.3 Would you recommend any industrial development to take place in the Paarl Valley? Explain your answer

No ✓✓

Because pollution will be trapped by the inversion layer ✓✓

Air / water pollution ✓✓

People will experience respiratory problems ✓✓

Acid rain will destroy the vegetation ✓✓

OR

Yes ✓✓

Flat land ✓✓

Access to raw material ✓✓

Availability of water ✓✓

Enough labour ✓✓

[Any ONE. Accept other justifiable reasons]

(2 x 2)

(4)

3.7 Name ONE factor visible on the topographical map that indicates that nature conservation is important to the inhabitants of the Paarl.

Paarlberg Nature Reserve ✓✓

Wild Flower Nature Reserve ✓✓

Protected areas / firebreaks ✓✓

[Any ONE]

(1 x 2)

(2)

[40]

QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

4.1 Data manipulation is used to control how features are represented on small and large-scale maps.

4.1.1 Explain the meaning of the term *data manipulation*.

The process used to organise data for your specific needs ✓✓

[Concept]

(1 x 2)

(2)

4.1.2 Explain why it is necessary to manipulate data on maps.

To make changes during data analysis ✓✓

To convert, re-arrange or analyse data to get answers ✓✓

To remove unnecessary information ✓✓

To add any additional information ✓✓

Where different projections are used you should be able to print

maps with the same projection ✓✓

Where different scales are used you should be able to print maps on

the same scale ✓✓

[Any ONE of the above- Accept other reasonable answer]

(1 x 2)

(2)

- 4.2 Two learners from a school in Paarl have an assignment and have to take photographs of the Berg River. One has a 2, 0 megapixel camera and the other has a 3,5 megapixel camera. The resolution of the photographs taken by the boys will differ.

4.2.1 Explain the meaning of the term *resolution*.

It refers to the degree of detail and clarity of an image. ✓✓
[Concept]

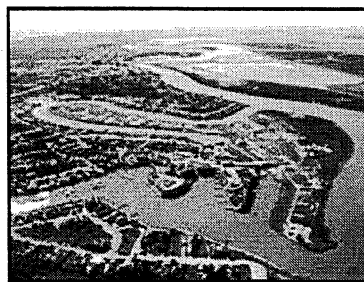
(1 x 2) (2)

4.2.2 Which one of the cameras will take better quality pictures? Explain your answer.

The one with 3,5 megapixels ✓✓
Because it is a higher resolution camera ✓✓
Higher definition / better definition ✓✓
More squares per unit area ✓✓
Larger pixels which lead to clear picture ✓✓
[Any TWO of the above]

(2 x 2) (4)

- 4.3 Heavy rainfall sometimes results in flooding along the Berg River, as is evident in the image below. How could the local government use GIS to manage this disaster?



The government could have used GIS in predicting floods ✓✓
Planning should have been done on how to control floods ✓✓
Communicate the occurrence of floods to the inhabitants ✓✓
GIS could enable the government to distribute information to the disaster management centres ✓✓
Use GIS to create a buffer zone around the river ✓✓
[Any TWO of the above – Accept other reasonable answer]

(2 x 2) (4)

- 4.4 Urbanisation has a negative impact on rivers. How will buffering prevent the mismanagement of the Berg River?

Indicates where no agriculture and industries can be located. ✓✓
Prevent pollution from pesticides and industrial wastes being deposited. ✓✓
Leave areas clear for urban expansion. ✓✓
Conserve natural areas / maintaining green belts. ✓✓
[Any TWO of the above]

(2 x 2) (4)

4.5 Why are map projections important for the users of GIS?

Has an influence on the level of distortion on a map / image ✓✓

Accurate calculation of areas ✓✓

Choosing the correct map / image for a particular purpose ✓✓

To know whether certain area are exaggerated or shrunk ✓✓

[Any One of the above]

(1 x 2)

(2)

[20]

TOTAL:

100