GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION

PREPARATORY EXAMINATION

2016

10782

GEOGRAPHY

SECOND PAPER

TIME: 1½ hours

MARKS: 75

NAME AND SURNAME:	

GEOGRAPHY: Paper 2
1078E
10782E

QUESTION NUMBER	Q1	Q2	Q3	Q4	TOT
MARKER					
MODERATOR					
MARK SCORED					
TOTAL	15	20	25	15	75

X10

This question paper consists of 15 pages and 1 page for rough work and calculations.

GAUTENG DEPARTMENT OF EDUCATION

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(Second Paper)

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RESOURCE MATERIAL

1. An extract from the topographic map 2829DB LADYSMITH
2. Orthophoto map 2829 DB 6 LADYSMITH
3. NOTE: The resource material must be collected by schools for their own use.

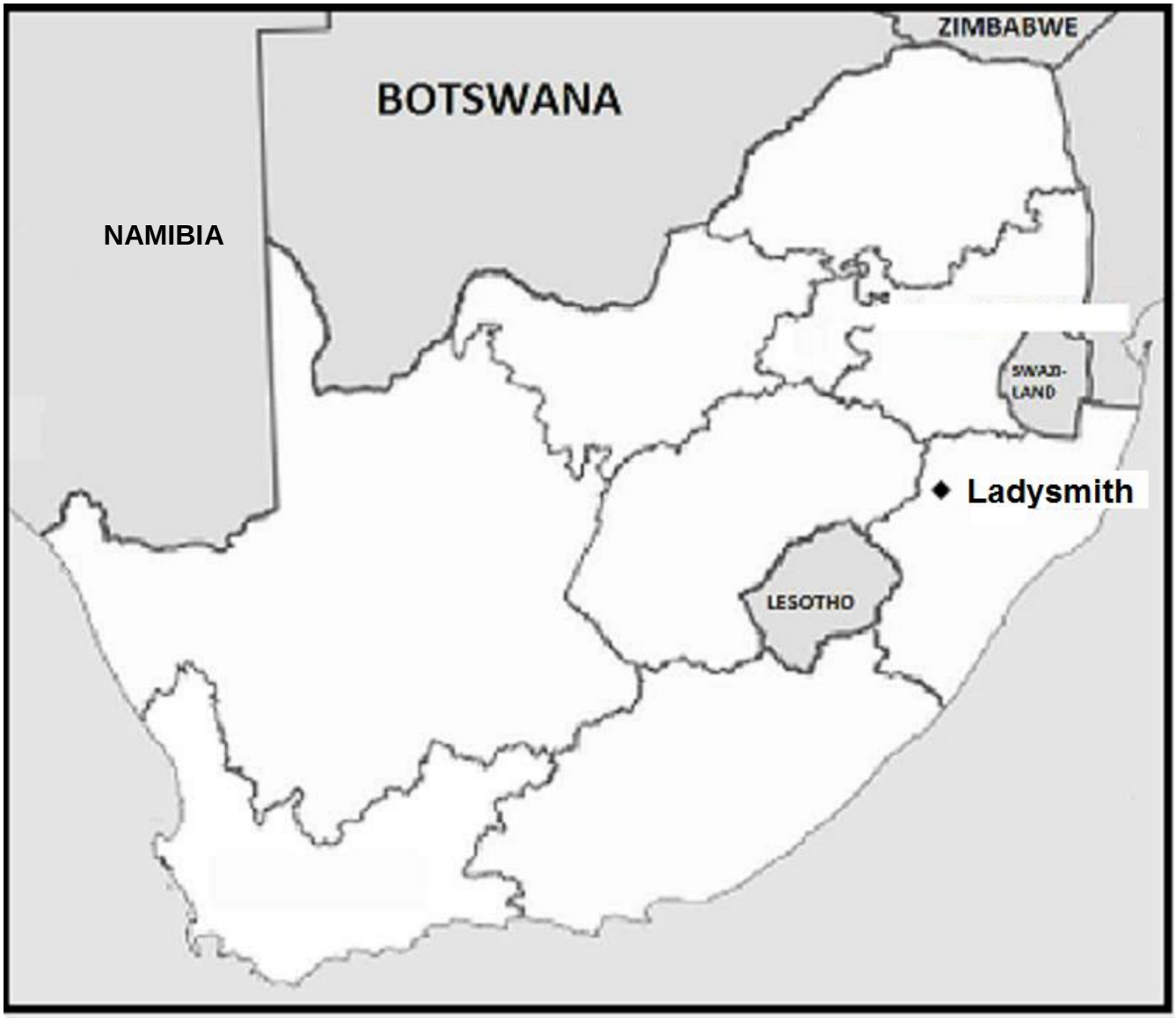
INSTRUCTIONS AND INFORMATION

1. Write your name in the space 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 topographic map 2829DB LADYSMITH and an orthophoto map 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 the 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, where applicable. Marks will be allocated for these.
7. You may use a non-programmable calculator.
8. The area demarcated in BLACK on the topographic map represents the area covered by the orthophoto map.
9. Indicate the unit of measurement in the final step of your calculation.

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

ENGLISH	AFRIKAANS
Furrow	*Voor*
Golf course	*Gholfbaan*
Landing strip	*Landingstrook*
Refuse dump	*Vullisstortingsterrein*
Rifle range	*Skietbaan*
River	*Rivier*
Sewage disposal works	*Rioolverwyderingswerke*
Sewage works	*Rioolwerke*

GENERAL INFORMATION ON LADYSMITH



[Adapted from http://en.wikipedia.org/wiki/Ladysmith]

Ladysmith is located on the banks of the Kliprivier in the foothills of the Drakensberg mountains, about 26 km from the Van Reenen's pass. The central business district and a large part of the residential areas are located within the flood basin of the river. Important industries in the area include food processing, textile and tyre production in the nearby town of Steadville.

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

The questions below are based on the 1:50 000 topographic map 2829DB 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 correct answer and write only the letter (A – D) in the block next to each question.

1.1 Ladysmith is situated in …

A Mpumalanga.
B the Free State Province.
C KwaZulu-Natal.
D the Eastern Cape.

1.2 The map index west of Ladysmith is …

A 2829DC.
B 2829DA.
C 2829BC.
D 2829DD.

1.3 The contour interval of the orthophoto map is … metres.

A 5
B 10
C 15
D 20

1.4 The grid reference of the Trigonometrical Station 98 in block **H10** is …

A 28°37'55"S 29°54'58"E / 28°37.9'S 29°54.9'E.
B 28°37'56"S 29°54'30"E / 28°37.9'S 29°54.5'E.
C 28°37'06"S 29°54'42"E / 28°37.1'S 29°54.7'E.
D 28°37'56"S 29°54'58"E / 28°37.9'S 29°54.9'E.

1.5 The actual distance from the Trigonometrical Station 330 in block **D7** to the Trigonometrical Station 117 in block **A10** on the topographic map is … km.

A 6,30
B 13,90
C 6,80
D 13,6

1.6 The land-use zone marked **1** on the orthophoto map is a …

A low income residential area.
B heavy industrial area.
C high income residential area.
D light industrial area.

1.7 The contour lines marked **K** (in block **I2**) on the topographic map illustrates a …

A spur.
B valley.
C neck.
D hill.

1.8 The service rendered at **7** on the orthophoto map is a …

A church.
B school.
C hospital.
D hotel.

1.9 The recreational area marked **2** on the orthophoto map is a …

A casino.
B swimming pool.
C park.
D stadium.

1.10 The stream channel pattern labelled **M** (in block **G7)** on the topographic map is a … pattern.

A meandering
B rock-controlled
C braided
D trellis

1.11 Identify the drainage pattern labelled **N** (in block **G1**) on the topographic map.

A Dendritic
B Trellis
C Deranged
D Parallel

1.12 The underlying rock structure at **N** (in block **G1**) on the topographic map is made up of …

A rocks of uniform resistance.
B an alternate layer of hard and soft rock.
C jointed igneous rocks.
D folded rocks.

1.13 Ladysmith is an example of a / an … town.

A central place
B satellite
C educational
D industrial

1.14 The structural landform at **P** (in block **D7**) on the topographic map is a …

A mesa.
B butte.
C ridge.
D cuesta.

1.15 The type and pattern of the settlement at **Q** (in block **G9**) on the topographic map is a/an …

A urban nucleated settlement.
B urban dispersed settlement.
C rural dispersed settlement.
D rural nucleated settlement.

(15x1) (15)

[15]

QUESTION 2: MAP CALCULATIONS AND TECHNIQUES

2.1 Calculate the magnetic bearing from spot height 995 in block **J8** to Trigonometrical Station 125 in block **H8** on the topographic map for the present year.

Formula: Magnetic bearing = Magnetic declination + True bearing

True bearing: _____

Difference in years: _____

Mean annual change: _____

Total change: _____

Magnetic declination for 2016: _____

_____

Magnetic Bearing: _____

_____

(6x1) (6)

2.2 Calculate the area covered by the orthophoto map on the topographic map in kilometres. (Use the area highlighted in black on the topographic map.) Show all calculations. Indicate the correct unit in your final answer.

Formula: Area = length x breadth

_____

_____

_____

_____

_____

(5x1) (5)

2.3 Locate points **3** and **4** on the orthophoto map.

2.3.1 Calculate the average gradient between point **3** and point **4** on the orthophoto map. Show ALL calculations. Marks will be awarded for calculations.

Formula: $\text{Gradient} = \frac{\text{vertical interval (VI)}}{\text{horizontal equivalent (HE)}}$

_____

_____

_____

_____

_____

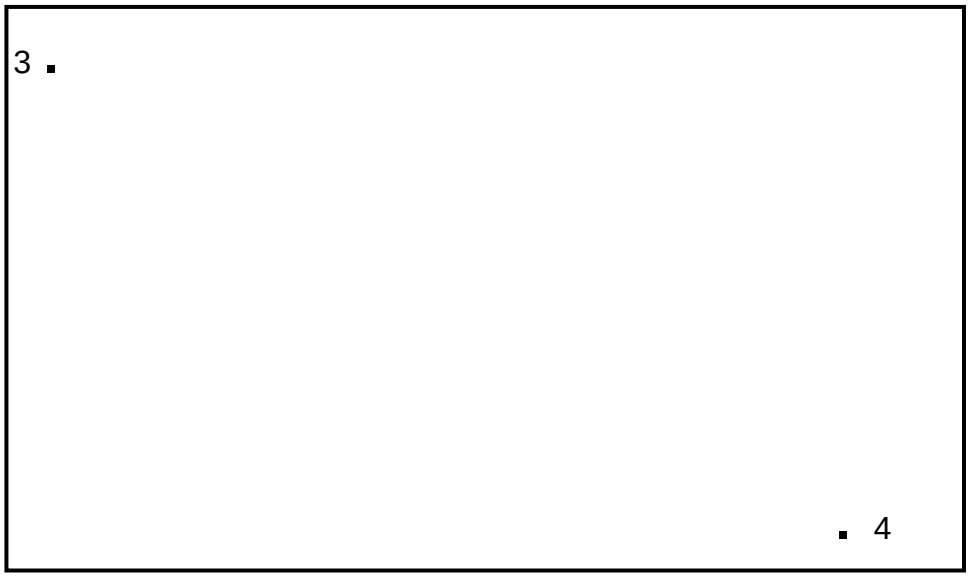
_____

_____

_____

(5x1) (5)

2.3.2 Draw a free-hand cross-section sketch from point **3** to point **4** in the box below.



(1x1) (1)

2.3.3 State the shape of the slope formed between points **3** and **4** on the orthophoto map.

_____

(1x1) (1)

2.3.4 Determine the intervisibility from point **3** to point **4**. Give a reason for your answer.

Answer: _____

Reason:_____

_____

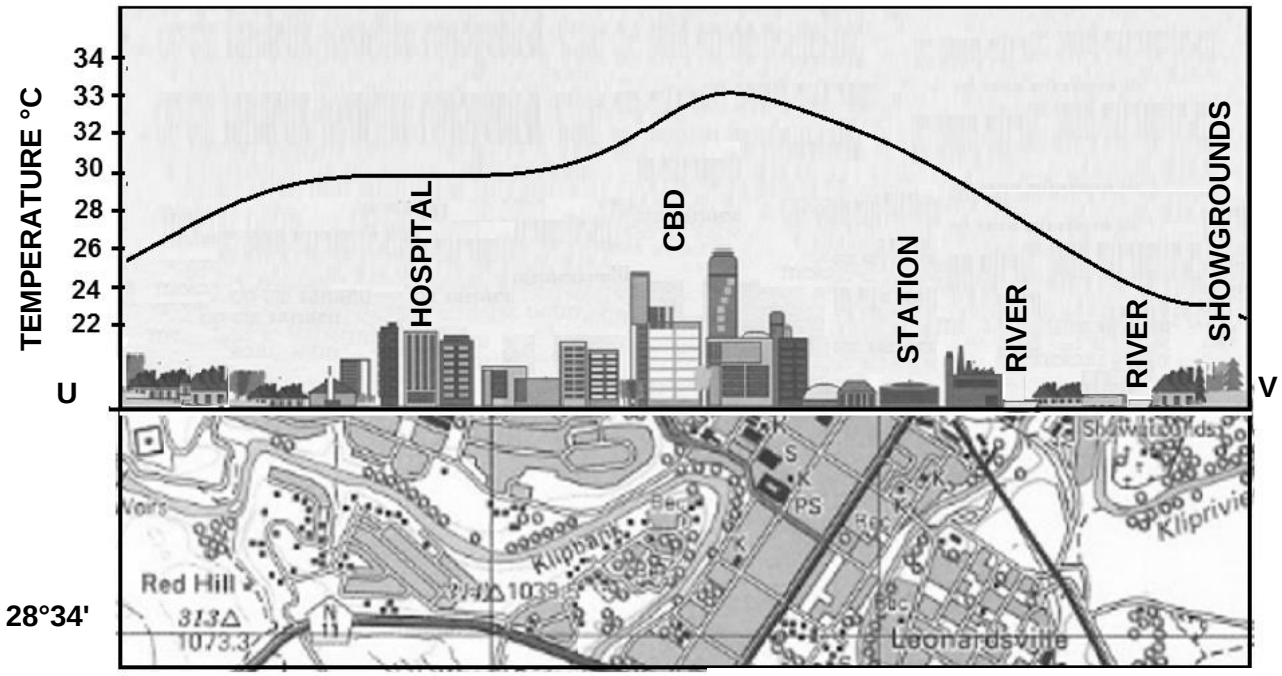
(2x1) (2)

[20]

QUESTION 3: APPLICATION AND INTERPRETATION

3.1 Refer to FIGURE 3.1 below showing the urban heat island between points **U** and **V** on the topographic map.

FIGURE 3.1: URBAN HEAT ISLAND OF LADYSMITH



Examiner's own sketch

3.1.1 Define the term *urban heat island*.

_____

_____

(1x1) (1)

3.1.2 Refer to point **R** in block **D2** on the topographic map.

(a) What is the temperature at **R**?

_____

(1x1) (1)

(b) Describe ONE factor at point **R** that could influence the development of the urban heat island.

_____

_____

(1x2) (2)

3.1.3 Explain how the green belts at **S** (in block **D3**) on the topographic map will impact on the development of the heat island and give a reason for your answer.

Answer: _____

_____

Reason: _____

_____

(2x2) (4)

3.2 Refer to blocks **E5** and **E6** on the topographic map.

3.2.1 Non-perennial rivers flowing on the east side of Steadville result in flash floods which could have a devastating effect on the settlement of Steadville in Block **E5**. State TWO factors evident on the topographic map, which could contribute to this devastating effect.

_____

_____

_____

_____

(2x1) (2)

3.2.2 Suggest TWO possible solutions that the people living in Steadville could implement to prevent or minimise this problem.

_____

_____

_____

_____

(2x2) (4)

3.3 Refer to residential areas **5** and **6** on the orthophoto map.

3.3.1 Name the street patterns found in residential areas **5** and **6**.

Area **5**: _____

Area **6**: _____

(2x1) (2)

3.3.2 Which street pattern, **5** or **6**, will reduce traffic congestion? Give a reason for your answer.

Answer: _____

Reason: _____

_____

(1 + 2) (3)

3.3.3 Ladysmith is a fast growing town, but urbanisation is hindered in the South West. Identify ONE physical factor that hinders the expansion of the town's boundaries to the South West.

_____

_____

(1x1) (1)

3.4 3.4.1 Identify the tertiary land-use indicated at **T** (in block **E4**) on the topographic map.

_____

(1x1) (1)

3.4.2 Explain how poor maintenance of the land-use at **T** will influence the water quality of the Kliprivier in block **E4**.

_____

_____

(1x2) (2)

3.4.3 Explain why this tertiary activity developed in the rural-urban fringe.

_____

_____

(1x2) (2)

[25]

QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

4.1 Due to the Kliprivier flowing through Ladysmith, flooding is a real possibility. Data layering assists in analysing the flood risk in Ladysmith.

4.1.1 What is *data layering?*

_____

_____

_____

(1x1) (1)

4.1.2 Identify THREE data layers that can assist you in analysing the flood risk along the banks of the Kliprivier in blocks **D1** and **D2**.

_____

_____

_____

_____

(3x1) (3)

4.1.3 State ONE GIS process that you would use to limit the risk of floods.

_____

(1x1) (1)

4.1.4 Explain how you would use the process mentioned in Question 4.1.3 to reduce the impact of floods.

_____

_____

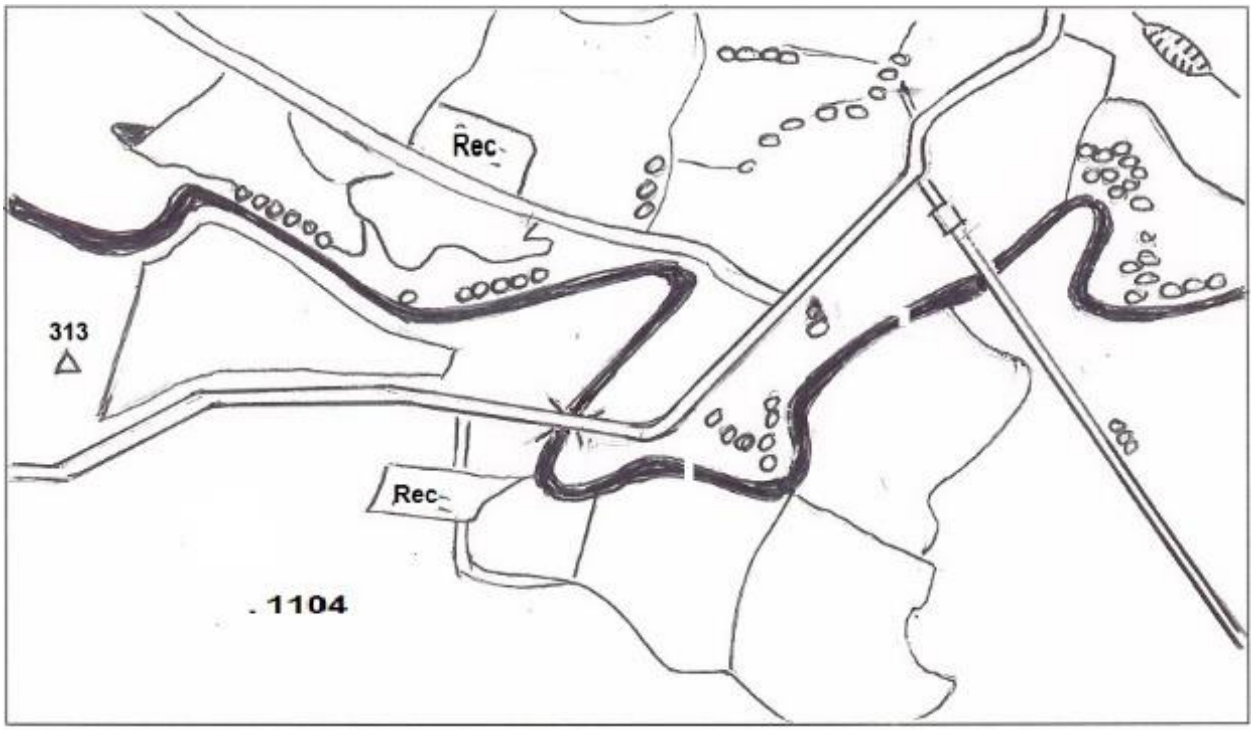
_____

_____

_____

(2x2) (4)

4.2 The following is a freehand-sketch map of the area covered by the orthophoto map.



Examiner's own sketch (Sketch is not drawn to scale)

4.2.1 Use both the orthophoto and topographic maps and label the following features ON THE SKETCH MAP by using the symbols in the key supplied.

Key: A – Rose Park
B – Wagon Bridge (2x1) (2)

4.2.2 State the spatial position of Rose Park from Wagon Bridge.

_____

(1x1) (1)

4.2.3 The topographic map was used to draw the sketch map. It is not possible to identify the density of the buildings. However, when using the orthophoto map, we can identify the density of the buildings.

(a) An orthophoto map consist of pixels. What type of data is a pixel?

_____

(1x1) (1)

(b) Explain how this type of data can assist you in identifying the density of the buildings.

_____

_____

(1x2) (2)

[15]

TOTAL: 75

END

ROUGH WORK AND CALCULATIONS
(NOTE: Do NOT detach this page from the question paper.)