PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. Write your examination number in the appropriate blocks provided above.

2. This paper consists of 16 pages. Please check that your paper is complete.

3. Read the questions carefully.

4. Answer ALL the questions in the spaces provided on the question paper.

5. Carefully study the 1:50 000 topographical map extract 2627CD PARYS and accompanying 1:10 000 orthophoto map extract 2627 CD 11 VENTERSKROON before answering the questions.

6. The topographic map has grid lines with markings A to H and 1 to 15 that may be used to identify locations.

7. The topographical map and orthophoto map extracts and your completed Answer Book must be handed to the invigilator at the end of the examination. The maps and photos may be retained by the school for future use.

8. On page 2 there is a glossary of words. This will help you understand what the words in **bold** in the questions are asking you to do. There is also an English-Afrikaans translation of some words appearing on the map.

9. A magnifying glass and calculator may be used.

10. It is in your own interest to write legibly and to present your work neatly.

11. You may use the back page for rough work.
### Glossary of words

<table>
<thead>
<tr>
<th>WORD</th>
<th>MEANING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculate</td>
<td>To work out the value of something using a mathematical method</td>
</tr>
<tr>
<td>Compare</td>
<td>To point out or show differences and similarities between two or more features/aspects</td>
</tr>
<tr>
<td>Contrast</td>
<td>To point out or show differences between two or more features/aspects</td>
</tr>
<tr>
<td>Describe</td>
<td>To say what something is like</td>
</tr>
<tr>
<td>Discuss</td>
<td>To write about something in detail</td>
</tr>
<tr>
<td>Explain</td>
<td>To describe something so that it can be understood</td>
</tr>
<tr>
<td>Identify</td>
<td>To give the essential characteristics of something</td>
</tr>
<tr>
<td>Indicate</td>
<td>To point out/show; to state briefly</td>
</tr>
<tr>
<td>Provide</td>
<td>To put forward or give</td>
</tr>
<tr>
<td>State</td>
<td>To present information or details plainly, directly and simply, without discussion</td>
</tr>
<tr>
<td>Suggest</td>
<td>To put forward ideas, a plan or reasons</td>
</tr>
</tbody>
</table>

### Translation of words

**English to Afrikaans**

<table>
<thead>
<tr>
<th>English</th>
<th>Afrikaans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borderpost</td>
<td>Grenspos</td>
</tr>
<tr>
<td>Bridge</td>
<td>Brug</td>
</tr>
<tr>
<td>Camping grounds</td>
<td>Kampeererrein</td>
</tr>
<tr>
<td>Caravan park</td>
<td>Woonwapark</td>
</tr>
<tr>
<td>Cattle enclosure</td>
<td>Kraal</td>
</tr>
<tr>
<td>Crown</td>
<td>Kroon</td>
</tr>
<tr>
<td>Drift or river crossing</td>
<td>Drif</td>
</tr>
<tr>
<td>Drive-in theatre</td>
<td>Inryteater</td>
</tr>
<tr>
<td>Farm</td>
<td>Plaas</td>
</tr>
<tr>
<td>Furrow</td>
<td>Kanaal</td>
</tr>
<tr>
<td>Gorge</td>
<td>Kloof</td>
</tr>
<tr>
<td>Hill</td>
<td>Koppie</td>
</tr>
<tr>
<td>Island</td>
<td>Eiland</td>
</tr>
<tr>
<td>Kudu</td>
<td>Koedoe</td>
</tr>
<tr>
<td>Lowlands</td>
<td>Laagte</td>
</tr>
<tr>
<td>Marsh or wetland</td>
<td>Vlei</td>
</tr>
<tr>
<td>Mountain</td>
<td>Berg</td>
</tr>
<tr>
<td>Protea (sugarbush)</td>
<td>Suikerbos</td>
</tr>
<tr>
<td>Rest</td>
<td>Rus</td>
</tr>
<tr>
<td>Ridge(s)</td>
<td>Rant(e), rif (riwwe)</td>
</tr>
<tr>
<td>River</td>
<td>Rivier</td>
</tr>
<tr>
<td>Road</td>
<td>Pad</td>
</tr>
<tr>
<td>Sewage works</td>
<td>Rioolwerke</td>
</tr>
<tr>
<td>Shooting range</td>
<td>Skietbaan</td>
</tr>
<tr>
<td>Spring or fountain</td>
<td>Fontein</td>
</tr>
<tr>
<td>Stream or river</td>
<td>Spruit</td>
</tr>
<tr>
<td>Watergap or Poort</td>
<td>Poort</td>
</tr>
</tbody>
</table>
Parys, the jewel of the Vaal River, is a fast developing country town in the Vredefort Dome area, the oldest and largest meteorite impact site in the world. It has become one of the most exclusive areas for property investments, with two 18-hole golf estates. Research shows that 9 000 – 12 000 vehicles pass through Parys on a busy day. Geographically, Parys is one of the most centrally situated towns in South Africa, with 75% of the country’s population living within a 200 km radius.

[Adapted from: <parys.co.za>]

1. **Atlas use, map reading and map projections**

1.1 Refer to the location map above, as well as the topographical map extract to answer the following questions. Tick the correct box.

1.1.1 The line of latitude marked A on the location map above is …

- 26° 54' E
- 27° 27' E
- 26° 54' S
- 27° 27' S

(1)

1.1.2 The line of longitude marked B on the location map above is …

- 27° 27' E
- 26° 54' S
- 26° 27' S
- 27° 54' E

(1)

1.1.3 The central meridian of the Gauss Conform Projection used for the topographical map extract 2627 CD Parys is …

- 27° S
- 18° E
- 27° E
- 26° E

(1)

1.1.4 The province labelled C on the location map above is …

- Gauteng
- Free State
- North-West
- Northern Cape

(1)
1.1.5 On the grid below, **indicate** the exact reference location of the 2627 CD Parys topographical map by drawing a square in the appropriate place below.

![Grid Diagram](image)

(2)

1.1.6 A number of physical features (A to E) have been labelled on the topographical map extract. **Identify** each labelled feature by circling the correct **underlined** word(s) listed below.

A (Block C6) stream braiding/alluvial fan
B (Blocks C11 – B12) gorge/ridge
C (Block D7) concave slope/convex slope
D (Block C7 – C8) river valley/spur
E (Blocks F4 and F5) The stream pattern is dendritic/radial. (5)

1.2 **Map orientation**

Study Photographs 1 to 4 on the following page. Refer to the topographical map extract. The block reference (e.g. E13) is given for each photograph. Once you have located the feature, read the statement and respond by **stating** TRUE or FALSE. **Provide** a reason for each answer, using map evidence.
<table>
<thead>
<tr>
<th>Photograph</th>
<th>Block reference on topographical map</th>
<th>Statement</th>
<th>TRUE or FALSE (T or F)</th>
<th>Provide a reason for your answer</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Bridge" /></td>
<td><strong>E 13</strong></td>
<td>This low-level bridge is the only link to Golf Island from Parys.</td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td><img src="image2.png" alt="Leeukop" /></td>
<td><strong>E 10</strong></td>
<td>This rocky outcrop called Leeukop has been quarried for its granite.</td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td><img src="image3.png" alt="Venterkroon" /></td>
<td><strong>E 2</strong></td>
<td>Venterskroon offers a variety of high-order functions and services.</td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td><img src="image4.png" alt="Shop" /></td>
<td><strong>E 12</strong></td>
<td>This shop located along the R500 just north of the Vaal River, is in the Free State.</td>
<td>(1)</td>
<td></td>
</tr>
</tbody>
</table>

**23 marks**
2. **Map skills and calculations: The Vredefort Dome World Heritage Site**

**Drainage and Relief Analysis**

Refer to the Fact File on the Vredefort Dome World Heritage Site, as well as the orthophoto and topographical map extracts. Parys is located within the Vredefort Dome.

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**Fact File – Vredefort Dome World Heritage Site**

The Vredefort Dome consists of at least three rings of overturned quartzite ridges extending outwards from the central impact area just south west of Parys.

Deep gorges or kloofs appear between the ridges where streams flow and eventually join the Vaal River. The World Heritage Site is privately owned by 450 landowners in the area. About 65% of these landowners are weekend farmers.

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2.1 2.1.1 Circle the correct underlined word.

Aasvoëlkop (blocks D3 and E3) is a **tor/hogsback.**

2.1.2 Using map evidence, **provide** ONE reason for your answer.

---

2.2 The Vaal River in this area is a superimposed drainage pattern. This drainage pattern … (tick the correct option):

- A forms in areas that have been folded and uplifted.
- B develops when the river is older than the features it flows over.
- C develops when the river is younger than the features it flows over.
- D forms when one river captures another river's headwaters.

---

2.3 Refer to the orthophoto map extract.

A sketch cross-section is drawn from spot height 1610 (X) to trigonometrical beacon 147 (Y). See below:
2.3.1 **Identify** the features labelled A and B on the sketch cross-section. Cross reference using the orthophoto map extract.

A (infrastructure): ________________________________ (2)

B (geomorphological): ________________________________ (2)

2.3.2 Mark in the position of and label the following features on the sketch cross-section (page 6):

- Conservation land-use (natural trees and bush/non-agricultural)
- Provincial boundary (4)

2.4 Refer to block D2 on the topographical map extract as well as the same location on the orthophoto map extract. Use the orthophoto map extract for your calculations in Question 2.4.1 and 2.4.2.

The annual Crater Cruise mountain bike race takes place in this area. Participants may use a quad bike, 4 × 4 or mountain bike route. Part of the course is an exciting downhill single track section from spot height 1610 (point X) to Netreg (point N) at the foot of the hill.

2.4.1 **Calculate** the approximate bearing a participant will take when racing from point X to point N.

Bearing _____________________________° (2)

2.4.2 **Calculate** the gradient of the single track (assuming it follows a straight line) from spot height 1610 (point X) to Netreg (point N).

(a) Difference in height: ________________________________ m (1)

(b) Distance between the two points: ______________________ m (1)

(c) Gradient of single track: 1: ________________________________ (2)

Calculations:
2.5  **Land-use map**

Refer to the topographical map extract. Focus on the blocked area B 3 – 7, C 3 – 7, and D 3 – 7.

2.5.1 In the grid below, draw a land-use map of the area marked. Complete the map by sketching in the following features:

- hills and ridges (highlands)
- valleys (lowlands)
- agricultural land (fields)
- Vaal River
- secondary roads

(10)

**Provide** labels on your map and use the key below.

<table>
<thead>
<tr>
<th></th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Key:**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>hills and ridges (highlands)</td>
</tr>
<tr>
<td>valleys (lowlands)</td>
</tr>
<tr>
<td>agricultural land (fields)</td>
</tr>
<tr>
<td>Vaal River</td>
</tr>
<tr>
<td>secondary roads</td>
</tr>
</tbody>
</table>
2.5.2 **Explain** how the relief has influenced the land-use and development of roads in the area shown in the sketch map on page 8 (2.5.1).

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- 

(4)

31 marks
3. **Settlement analysis**

Refer to the topographical map extract, as well as the orthophoto map extract.

3.1 **Rural settlement**

Study the 1:50 000 topographic map extract to answer the following questions.

3.1.1 Study blocks F9, 10 and 11. Many of the farms consist of long, narrow strips extending from the Vaal River banks. **Suggest ONE** reason for this unusual farm layout.

3.1.2 The Vaal River is a permanent river, but most of its tributaries are non-perennial. **Suggest ONE** reason for this.

3.1.3 Circle the correct underlined words. Using map evidence, **provide ONE** reason for your answer.

Eldorado (E8) uses *ground water/river water* for irrigation.

Reason:

3.1.4 Tick the correct option.

The rural settlement pattern in block E 12 resembles a … pattern:

- star shaped
- circular
- cobweb
- linear

(2)
3.1.5 The Parys area is a popular getaway destination for many city dwellers, who opt for a peaceful, agricultural weekend. Study Photographs 5 and 6 which show a smallholding for sale. The smallholding (marked F) is located in block E9 on the topographical map extract.

**Photograph 5** Smallholding for sale (F)  **Photograph 6** Buildings and dam on the smallholding for sale (F)

Describe TWO site and TWO situational factors which make this smallholding attractive to a potential investor. Use map evidence and your knowledge of rural settlements.

Attractive site factors:
1. 
2. (4)

Attractive situation factors:
1. 
2. (4)

3.2 **Urban Settlement**

3.2.1 Parys is classified as a central place. Using map evidence, suggest ONE reason for this classification.

• 

(2)
3.2.2 Using map evidence, **describe** TWO features which suggest Parys was originally laid out as a typical apartheid town.

- ........................................................................
- ........................................................................
- ........................................................................

(4)

3.2.3 **Compare and contrast** the built-up areas of Parys and Tumahole in the south-east corner of the topographical map extract. Complete the following table.

<table>
<thead>
<tr>
<th>Features of the built-up areas</th>
<th>Parys</th>
<th>Tumahole</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominant street pattern</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building density</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examples of recreational facilities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(6)

29 marks
4. **Fieldwork and Research**

4.1 Study Maps 1 to 3 below which show three different data layers for the immediate area around Parys. These layers or themes of information are an important concept used in Geographic Information Systems (GIS).

**Map 1** The Vaal River

![Map 1: The Vaal River](image)

**Key**
- River islands which are utilised
- Area under flood risk

**4.1.1 (b)**

**Map 2** Infrastructure in the area

![Map 2: Infrastructure in the area](image)

**Key**
- Roads in the area
- Railway and station

**Map 3** Built-up areas

![Map 3: Built-up areas](image)
4.1.1 Buffering is a GIS tool used by the Parys Municipality to determine the amount of flooding that could occur, should the sluice gates of the nearby Vaal Dam be opened.

(a) **Explain** the meaning of the term buffering.

(b) Draw a 0.3 cm buffer strip (or line) on either side of the Vaal River in Map 1 (page 13). Shade and label this area: Area under flood risk. Complete the key.

4.1.2 **Discuss** why the Municipality of Parys finds the information contained in Maps 1, 2 and 3 (page 13) useful for flood management.

-  
-  
-  

4.1.3 Refer to Maps 1, 2 and 3 (page 13) and Photograph 7.

**Photograph 7: Working for Water**

As the management of the Vredefort Dome World Heritage Site is in the hands of 450 farmers in the area, the *Working for Water* programme is an important management strategy for this catchment area of the Vaal River. Write a letter to this conservation body highlighting the importance of both the Parys Municipality and the farmers in the area adopting the *Working for Water* programme to sustainably manage the water resources along the Vaal River. Use page 15 for your letter.
Letter to the Vredefort Dome World Heritage Site Conservation Body

Re: The importance of the Parys Municipality and the Vredefort Dome farmers adopting the Working for Water programme to sustainably manage water resources along the Vaal River.
Rough work