75

Education

KwaZulu-Natal Department of Education

NATIONAL SENIOR CERTIFICATE

GRADE 12

GEOGRAPHY P2

PREPARATORY EXAMINATION

SEPTEMBER 2018

MARKS: 75

TIME: 1½ Hours

This question paper consists of 13 pages and 1 page for rough work.

NAME: _____

DIVISION: _____

RESOURCE MATERIAL

1. An extract from topographical map 2627CD PARYS.
2. Orthophoto map 2627CD 19 PARYS.
3. **NOTE:** The resource material must be collected by schools for their own use.

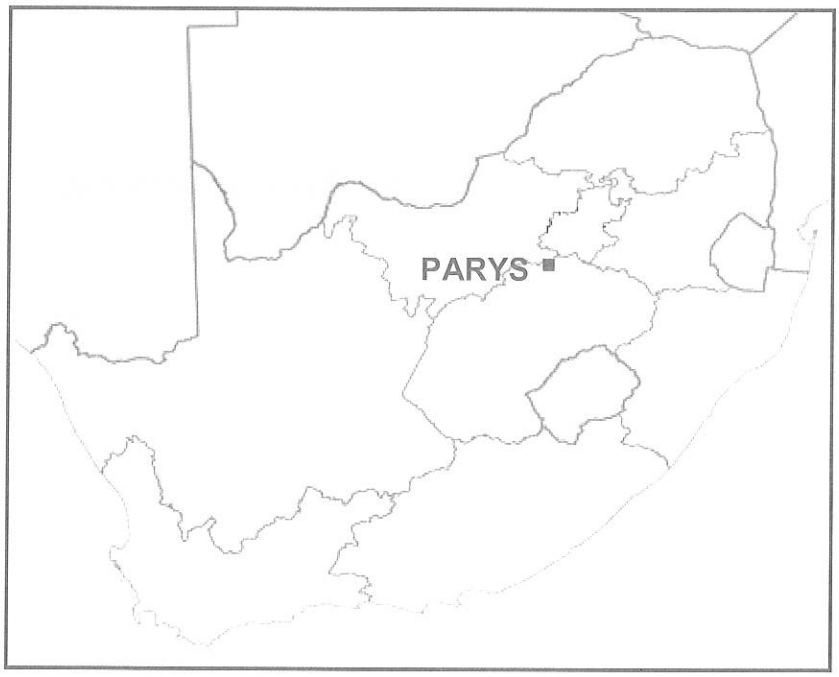
INSTRUCTIONS AND INFORMATION

1. Write your NAME and DIVISION 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 topographical map (2627CD PARYS) and an orthophoto map (2627CD 19 PARYS) 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 may 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. Indicate the unit of measurement in the final answer of calculations e.g 1km, 30km^2 etc.
8. You may use a non-programmable calculator.
9. The following English terms and their Afrikaans translations are shown on the topographical map:

ENGLISH	AFRIKAANS
Aerodome	Vliegveld
Caravan Park	Karavaanpark
Diggings	Uitgrawings
Golf Course	Gholfbaan
Gap	Poort
Holiday Resort	Vakansieoord
Island	Eiland
Purification Plant	Watersuiweringsaanleg
River	Rivier
Sewage Works	Rioolwerke

GENERAL INFORMATION ON PARYS

Parys is a town in the Free State in South Africa. It is located on the banks of the Vaal River approximately 115 km south of Johannesburg. The completion of the railway line to Parys in 1905 suddenly made Parys more accessible to the public and this, in turn, led to the growth of the town as a holiday resort and industrial centre. Many artists have settled in the town and the variety of new, interesting shops and attractions make it the ideal breakaway from Gauteng and other big centres. Parys lies within the Vredefort Dome World Heritage Site. The Vredefort Crater is the largest verified impact crater on Earth. The Vredefort Dome was added to the list of UNESCO World Heritage Sites for its geological interest.



Coordinates: 26°54'S 27°27'E

[Adapted from http://en.wikipedia.org/wiki/Parys, South Africa, Freestate]

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

The questions below are based on the 1:50 000 topographical map (2627 CD PARYS), as well as the orthophoto map (2627CD 19 PARYS) as 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 The index of the topographical map sheet to the south-west of 2627CD Parys is …

A 2627 DA.
B 2727 BA.
C 2627 CA.
D 2727 AA.

1.2 The orthophoto map scale of 1:10 000 means that one centimetre on the map represents … kilometres on the ground.

A 0.01
B 0.1
C 0.5
D 0.05

1.3 The orthophoto map of Parys was drawn using the … projection.

A Transversal
B Lambert
C Mercator
D Gauss conform

1.4 The altitude (height above sea level) of the northern runway of the Parys Aerodrome in block **G10** on the topographical map is … metres.

A 1400
B 1450
C 1420
D 1480

1.5 The landform represented by the letter **4** on the orthophoto map is a…

A valley.
B spur.
C saddle.
D butte.

1.6 The street pattern found in area **P** on the topographical map is …

A planned irregular.
B grid iron.
C radial.
D unplanned irregular.

1.7 The natural feature found in block **J3** on the topographical map is a/an …

A ox-bow lake.
B marsh and vlei.
C braided stream.
D delta.

1.8 The slope found between **11** and **12** on the orthophoto map is a … slope.

A gentle
B convex
C terraced
D concave

1.9 The farming activity being practised on the farm Pistorious Rust in the south east of the orthophoto map is … farming.

A pastoral
B fruit
C poultry
D crop

1.10 The human-made feature labelled **K** on the topographical map is a …

A water tower.
B reservoir.
C windpump.
D water point.

1.11 The Diggings found at **10** on the orthophoto map is classified as a … economic activity.

A primary
B secondary
C tertiary
D quaternary

1.12 The land-use zone at **T** in block **I 9** on the topographical map is …

A residential.
B industrial.
C commercial.
D recreational.

1.13 Orthophoto map evidence indicates that expansion of Parys is most limited in a … direction.

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

1.14 The drainage pattern in block **I 1, I 2 and I 3** on the topographical map is a … pattern.

A trellis
B radial
C dendritic
D parallel

1.15 The type of rural settlement found at Buffelshoek in block **A 6** on the topographical map is a/an…

A isolated farmstead.
B hamlet.
C village.
D town.

15 x 1 [15]

QUESTION 2: MAP CALCULATIONS AND INTERPRETATION

2.1 Locate the largest dam at Rietpoort in block **F6** and calculate the length of the dam wall in metres. Show all your calculations.

_____

_____

_____

_____ (2 x 1) (2)

2.2 Refer to spot height 1493 in block **D5** and spot height 1573 in block **E6** on the topographical map.

2.2.1 Calculate the average gradient between spot height 1493 and spot height 1573. Show all your calculations.

Formula: Gradient = $\frac{\text{Vertical interval (VI)}}{\text{Horizontal Equivalent (HE)}}$

_____

_____

_____

_____

_____

_____ (5 x 1) (5)

2.2.2 Interpret your answer to QUESTION 2.2.1.

_____

_____

_____

_____ (1 x 1) (1)

2.2.3 Give the term that is used to describe the fact that the mountain on which spot height 1493 is located can be seen from the ridge where spot height 1573 is located on the topographical map.

_____ (1 x 1) (1)

2.3 Calculate the magnetic declination of Parys for the year 2018.

(5 x 1) (5)

2.4 A cross-section is drawn between points **11** and **12** on the orthophoto map. Assume that the vertical scale is 1cm represents 40m.

2.4.1 Calculate the vertical exaggeration of the cross-section. Show all your calculations.

Formula: Vertical exaggeration = $\frac{\text{Vertical scale (VS)}}{\text{Horizontal scale (HS)}}$

(5 x 1) (5)

2.4.2 Provide ONE reason why it is necessary for the vertical scale in a cross-section to be exaggerated (made bigger)

(1 x 1) (1)

[20]

QUESTION 3: APPLICATION AND INTERPRETATION

3.1 Study the table below showing temperatures for the area **P** and **W** in block **H 7** on the topographical map and answer the questions.

	P	W
Average summer temperature s	24°	19°

3.1.1 Calculate the differences in temperature between area **P** and **W**.

_____ (1 x 1) (1)

3.1.2 Give **TWO** possible reasons for the difference in temperature mentioned in your answer to QUESTION 3.1.1.

_____

_____

_____

_____ (2 x 2) (4)

3.2 Refer to Block **G 2, G 3** and **H 3** on the topographical map.

3.2.1 Name the stream channel pattern of the Vaal river in blocks **G 3** and **H 3**.

_____

_____ (1 x 2) (2)

3.2.2 Give **ONE** piece of evidence from blocks **G 3** and **H 2** to substantiate your answer to QUESTION 3.2.1.

_____

_____

_____ (1 x 2) (2)

3.2.3 Explain why laminar flow is taking place in the Vaal river block **G 2.**

_____

_____ (1 x 2) (2)

3.3 Refer to the land-use zone **U** on the topographical map.

3.3.1 Identify the land-use zone.

_____ (1 x 1) (2)

3.3.2 Mention **TWO** factors that may have influenced the location of the land-use zone **U**.

_____

_____

_____ (2 x 1) (2)

3.3.3 Discuss **ONE** problem the residents of the settlement next to the land-use zone **U** could experience.

_____ (1 x 2) (2)

3.4 Tourism makes a large contribution to the economy of Parys.

3.4.1 List **TWO** potential tourist attractions that would attract people to Parys.

_____

_____ (2 x 1) (2)

3.4.2 Give **TWO** positive economic impacts that the tourism industry could bring to the local community of Parys.

_____

_____

_____

_____ (2 x 1) (2)

3.5 Refer to block **I 5** on the topographical map.
The local municipality has asked the town planning department to extend the existing landing strip to accommodate larger aircraft.

Explain how this expansion will negatively affect the surrounding natural environment.

_____

_____

_____

_____ (2 x 2) (4)
[25]

QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

4.1 Refer to block **F 1** on the topographical map.

4.1.1 Define the term *data layering.*

_____

_____

_____ (1 x 1) (1)

4.1.2 Name **THREE** layers that encouraged the farmer to place his farm in that specific area.

_____

_____

_____

_____ (3 x 1) (3)

4.1.3 State **TWO** uses of data layering in GIS.

_____

_____

_____

_____ (2 x 1) (2)

4.2 Refer to blocks **G 7** and **G 8** on the topographical map.

There is no buffering between the Vaal river and the town of Parys in block **G 7** and **G 8**.

4.2.1 Define the term *buffering.*

_____

_____

_____

_____ (1 x 1) (1)

4.2.2 Explain why buffering along the Vaal river in blocks **G 7** and **G 8** is important.

_____

_____

_____

_____ (1 x 2) (2)

4.2.3 Mention ONE way remote sensing can be used to monitor and manage the activities along the Vaal river during periods of heavy rainfall.

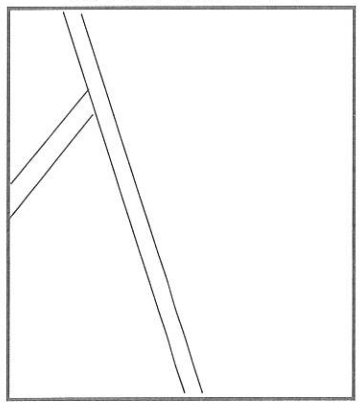
_____

_____

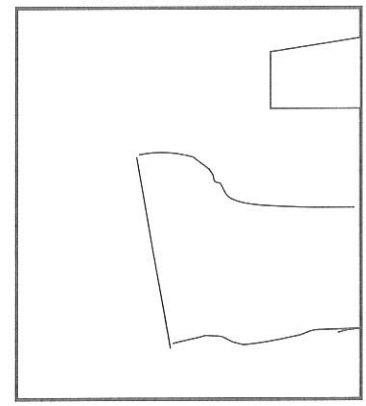
_____ (1 x 2) (2)

4.3 The following layers were taken from block **J 9** on the topographical map.

DATA LAYER 1



DATA LAYER 2



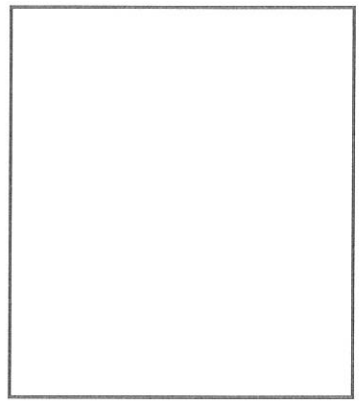
4.3.1 Define the term *data integration.*

_____

_____

_____ (1 x 1) (1)

4.3.2 Integrate the information from data layer 1 and data layer 2 in the block provided below.



(2 x 1) (2)

4.3.3 State **ONE** problem a cartographer (map maker) might experience when integrating different sets of data.

_____

_____

_____

_____ (1 x 1) (1)

[15]

TOTAL MARKS: 75

ROUGH WORK (Do not detach this page)

Education

KwaZulu-Natal Department of Education
REPUBLIC OF SOUTH AFRICA

GEOGRAPHY P2

PREPARATORY EXAMINATION

MARKING GUIDELINE

SEPTEMBER 2018

NATIONAL SENIOR CERTIFICATE

GRADE 12

MARKS: 75

This marking guideline consists of 11 pages.

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

The questions below are based on the 1:50 000 topographical map (2627 CD PARYS), as well as the orthophoto map (2627CD 19 PARYS) as 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 The index of the topographical map sheet to the south-west of 2627CD Parys is ...

A 2627 DA.
B 2727 BA.
C 2627 CA.
D 2727 AA.

D ✓

1.2 The orthophoto map scale of 1:10 000 means that one centimetre on the map represents ... kilometres on the ground.

A 0.01
B 0.1
C 0.5
D 0.05

B ✓

1.3 The orthophoto map of Parys was drawn using the ... projection.

A Transversal
B Lambert
C Mercator
D Gauss conform

D ✓

1.4 The altitude (height above sea level) of the northern runway of the Parys Aerodrome in block **G10** on the topographical map is ... metres.

A 1400
B 1450
C 1420
D 1480

C ✓

1.5 The landform represented by the letter **4** on the orthophoto map is a...

A valley.
B spur.
C saddle.
D butte.

A ✓

1.6 The street pattern found in area **P** on the topographical map is ...

A planned irregular.
B grid iron.
C radial.
D unplanned irregular.

B✓

1.7 The natural feature found in block **J3** on the topographical map is a/an ...

A ox-bow lake.
B marsh and vlei.
C braided stream.
D delta.

B✓

1.8 The slope found between **11** and **12** on the orthophoto map is a ... slope.

A gentle
B convex
C terraced
D concave

A✓

1.9 The farming activity being practised on the farm Pistorious Rust in the south east of the orthophoto map is ... farming.

A pastoral
B fruit
C poultry
D crop

D✓

1.10 The human-made feature labelled **K** on the topographical map is a ...

A water tower.
B reservoir.
C windpump.
D water point.

C
✓

1.11 The Diggings found at **10** on the orthophoto map is classified as a ... economic activity.

A primary
B secondary
C tertiary
D quaternary

A✓

1.12 The land-use zone at **T** in block **I 9** on the topographical map is ...

A residential.
B industrial.
C commercial.
D recreational.

A✓

1.13 Orthophoto map evidence indicates that expansion of Parys is most limited in a ... direction.

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

C✓

1.14 The drainage pattern in block **I 1** , **I 2** and **I 3** on the topographical map is a ... pattern.

A trellis
B radial
C dendritic
D parallel

C✓

1.15 The type of rural settlement found at Buffeshoek in block **A 6** on the topographical map is a/an...

A isolated farmstead.
B hamlet.
C village.
D town.

B/C✓

15 x 1 [15]

QUESTION 2: MAP CALCULATIONS AND INTERPRETATION

2.1 Locate the largest dam at Rietpoort in block **F6** and calculate the length of the dam wall in metres.

Show all your calculations

Length = 0,4✓ x 0,5 x 1000 = 200 m✓ (range 150m – 250m) (range 0,3-0,5) (2 x 1) (2)

2.2 Refer to spot height 1493 in block **D5** and spot height 1573 in block **E6** on the topographical map.

2.2.1 Calculate the average gradient between spot height 1493 and spot height 1573. Show all your calculations.

Formula: Gradient = $\frac{\text{Vertical interval (VI)}}{\text{Horizontal Equivalent (HE)}}$

VI = 1573 – 1493 = 80m ✓

HE = 3,1 x 0,5 x 1000 =1550 ✓ (range 2,9 - 3,3) (1450 -1650)

$= \frac{80}{1550}$ ✓

$= \frac{1}{19.38}$ ✓

= 1:19,38 ✓ (1:18.12 – 1:20.6) (5 x 1) (5)

2.2.2 Interpret your answer to QUESTION 2.2.1.

For every one metre rise, one walks 19.38 metres horizontally. ✓
[Concept] (1 x 1) (1)

2.2.3 Give the term that is used to describe the fact that the mountain on which spot height 1493 is located can be seen from the ridge where spot height 1573 is located on the topographical map.

Intervisible /intervisibility✓ (1 x 1) (1)

2.3 Calculate the magnetic declination of Parys for the year 2018.

Magnetic declination for 2011 = 18° 52'

Mean annual change = 2' W

Difference in years = 2018 – 2011 = 7 years✓

Mean annual change = 7 years x 2' = 14'✓

MD for current year = 18° 52' +✓ 14'
= 18° 66'✓
= 19 ° 06' W of True North ✓ (5 x 1) (5)

2.4 A cross-section is drawn between points **11** and **12** on the orthophoto map. Assume that the vertical scale is 1cm represents 40m.

2.4.1 Calculate the vertical exaggeration of the cross-section. Show all your calculations.

Formula: Vertical exaggeration = $\frac{\text{Vertical scale (VS)}}{\text{Horizontal scale (HS)}}$

VS = 1 cm : 40 m ✓ (therefore 40m = 40 x 100 = 4000)

HS = 1 cm : 10 000 cm ✓

$VE = \frac{1}{4000} \div \frac{1}{10\,000}$ ✓

$= \frac{1}{4000} \times \frac{10\,000}{1}$ ✓

= 2.5 times ✓ (5 x 1) (5)

2.4.2 Provide ONE reason why it is necessary for the vertical scale in a cross section to be exaggerated (made bigger)

It allows for the relief features to be seen more clearly ✓
If the vertical scale is not exaggerated, the relief feature will be flat ✓
[Any ONE] (1 x 1) (1)

[20]

QUESTION 3: APPLICATION AND INTERPRETATION

3.1 Study the table below showing temperatures for the area **P** and **W** in block **H 7** on the topographical map and answer the questions.

Area	P	W
Average summer temperature s	24°C	19°C

3.1.1 Calculate the difference in temperature between area **P** and **W.**

5°C ✓ (1 x 1) (1)

3.1.2 Give TWO possible reasons for the difference in temperature mentioned in your answer to QUESTION 3.1.1.

Area P has a higher temperature because it is located further away from the river✓✓
Area P lacks vegetation to absorb the heat /absence of a greenbelt✓✓

Area W has a lower temperature and is cooler because is closer to the river/close to the river/cooling effect ✓✓
Greater amount of vegetation resulting in more evapotranspiration and reducing temperatures/presence of a greenbelt✓✓
(ANY TWO) (2 x 2) (4)

3.2 Refer to Block **G 2, G 3** and **H 3** on the topographical map.

3.2.1 Name the stream channel pattern of the Vaal river in blocks **G 3** and **H 3**.

Meandering✓ (1 x 2) (2)

3.2.2 Give **ONE** piece of evidence from blocks **G 3** and **H 2** to substantiate your answer to QUESTION 3.2.1.

Bends in the river over a gentle gradient ✓✓
The river swings from side to side ✓✓
[Any ONE] (1 x 2) (2)

3.2.3 Explain why laminar flow is taking place in the Vaal river in block **G 2.**

Gentle gradient results in the river flowing slowly✓✓
The river is wide at this point allowing for a greater spread of water and reducing the speed✓✓
The river island reduces the speed/velocity of water in the river✓✓
[Any ONE] *(1 x 2) (2)*

3.3 Refer to the land-use zone **U** on the topographical map.

3.3.1 Identify the land-use zone.

Industrial zone ✓✓ (1 x 2) (2)

3.3.2 Mention **TWO** factors that may have influenced the location of the land-use zone **U**.

Power supply – power lines ✓✓
The land is flat ✓✓
Land is cheap ✓✓
Close to transport ✓ routes- road and rail ✓✓
Open space for further expansion ✓✓
Raw material – diggings nearby ✓✓
Labour supply – near built up area ✓✓
[Any TWO] (2 x 1) (2)

3.3.3 Discuss **ONE** problem the residents of the settlement next to the land-use zone **U** could experience.

Air pollution/noise pollution/water pollution from industries✓✓
Acid rain due to pollutants forming condensation nuclei✓✓
Respiratory problems from soot and dust ✓✓
Traffic congestion due to big trucks moving goods✓✓

[Any ONE] (1 x 2) (2)

3.4 Tourism makes a large contribution to the economy of Parys.

3.4.1 List **TWO** potential tourist attractions that would attract people to Parys.

Vredefort crater – largest verified impact crater on Earth ✓
Vredefort Dome – a world heritage site ✓
The Vaal river – water sport✓
Golf course ✓
Caravan park ✓
[Any TWO] (2 x 1) (2)

3.4.2 Give **TWO** positive economic impacts that the tourism industry could bring to the local community of Parys.

Increase in investments ✓
Job opportunities ✓
Improved infrastructure/ improvement in transport and services ✓
Greater buying power, more employed, more spending ✓
[Any TWO] (2 x 1) (2)

3.5 Refer to block **I 5** on the topographical map.
The local municipality has asked the town planning department to extend the existing landing strip to accommodate larger aircraft.

3.5.1 Explain how this expansion will negatively affect the surrounding natural environment.

Removal of vegetation to make way for development will result in the loss of habitat for plant and animals ✓✓
Biodiversity decreases ✓✓
Pollution to the Vaal River with the construction process ✓✓
Lowering of water levels ✓✓
Noise levels increase due to more aircraft landing and taking off ✓✓
Air pollution due to more aircraft activity ✓✓
Changes of the natural environment into concrete could result in flooding ✓✓
[Any TWO] (2 x 2) (4)

[25]

QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

4.1 Refer to block **F 1** on the topographical map.

4.1.1 Define the term *data layering.*

It is the placing of different layers of data on top of one another. ✓
[CONCEPT] (1 x 1) (1)

4.1.2 Name **THREE** layers that encouraged the farmer to place his farm in that specific area.

Drainage ✓
Water supply ✓
Access to water ✓
Rivers ✓

Topography or relief ✓
Flat land ✓
Availability of space ✓

Infrastructure ✓
Roads ✓
Secondary roads ✓
Other roads ✓
[Any THREE different layers or examples] (3 x 1) (3)

4.1.3 State **TWO** uses of data layering in GIS.

Different sets of data can be combined ✓
Relationships between different sets of data can be established ✓
Analysis of different layers of information can be made ✓
Comparisons can be made ✓
[Any TWO] (2 x 1) (2)

4.2 Refer to blocks **G 7** and **G 8** on the topographical map.

There is no buffering between the Vaal river and the town of Parys in block **G 7** and **G 8**.

4.2.1 Define the term *buffering.*

Demarcating of an area around a feature ✓
[CONCEPT] (1 x 1) (1)

4.2.2 Explain why buffering along the Vaal River in blocks **G 7** and **G 8** is important

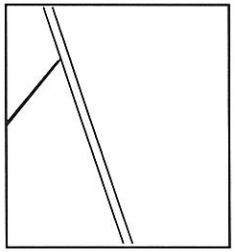
Allows the river to maintain its natural state ✓✓
Preserves the natural flora and fauna ✓✓
The biodiversity of the river will be protected ✓✓
To reduce the impact of flooding ✓✓
[Any ONE] (1 x 2) (2)

4.2.3 Mention ONE way remote sensing can be used to monitor and manage the activities along the Vaal River during periods of heavy rainfall.

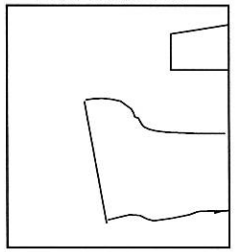
Remote sensing gives an overview of a large area ✓✓
Monitor the river without being at the site to obtain data ✓✓
A disaster management plan can be drawn up with the data ✓✓
Weather conditions have limited influence in obtaining data ✓✓
Can access places that usually cannot be reached during flooding ✓✓
Early flood warnings ✓✓
The data can be updated regularly ✓✓
[ANY ONE] (1 x 2) (2)

4.3 The following layers were taken from block **J 9** on the topographical map.

DATA LAYER 1



DATA LAYER 2

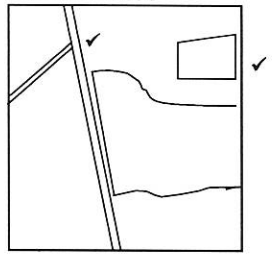


4.3.1 Define the term *data integration.*

Combining different sources of information to give the user a unified view ✓
[CONCEPT] (1 x 1) (1)

4.3.2 Integrate the information from data layer 1 and data layer 2 in the Block provided below.

DATA LAYER 3



(2 x 1) (2)

4.3.3 State **ONE** problem a cartographer (map maker) might experience when integrating different sets of data.

Using of different scales ✓
Getting the scale accurate ✓
Getting the shapes of the features correct ✓
[Any ONE] (1 x 1) (1)

[15]

TOTAL MARKS: 75