GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

SECONDARY SCHOOL IMPROVEMENT PROGRAMME (SSIP) 2019

GEOGRAPHY

REVISED

ANSWER BOOK

MAPWORK

GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

UNITY IN DIVERSITY

GRADE 12

SESSION 14: MAPWORK
TOPIC 14: SHORT QUESTIONS AND CALCULATIONS

SECTION B: ANSWERS TO EXAM TYPE QUESTIONS

Solution to Question 1

    1.1.   D✓
    1.2.   B✓
    1.3.   C✓
    1.4.   B✓
    1.5.   C✓
    1.6.   B✓
    1.8.   C✓
    1.9.   C✓
    1.10. D✓
    1.11. C✓
    1.12   D✓   (12 x 1 = 12)

Solutions to question 2:

    2.1.   B✓✓
    2.2.   A✓✓
    2.3.   A✓✓
    2.4.   C✓✓
    2.5.   C✓✓
    2.6.   D✓✓
    2.7.   B✓✓
    2.8.   B✓✓
    2.9.   D✓✓
    2.10. B✓✓   (10 x 10 = 10)

QUESTION 3:

    3.1.   B✓✓
    3.2.   D✓✓
    3.3.   C✓✓
    3.4.   B✓✓
    3.5.   C✓✓
    3.6.   B✓✓
    3.7.   A✓✓
    3.8.   A✓✓
    3.9.   C✓✓
    3.10   A✓✓   (10 x 1 = 10)

QUESTION 4

4.1.1. Yes ✓   (1)

4.1.2. No high-lying ground/obstructions between the two given points ✓   (1)

4.1.3. Vertical exaggeration = <u>vertical scale</u>

                                          Horizontal scale✓

                        = <u>1:500</u>
                           1:10 000✓

                        = <u>1</u>   x   <u>10000</u>✓
                           500   1

                        = 20 times larger than horizontal scale   ✓   (4)

4.2.1. Vertical Interval/Rise/Distance = 553 m - 532 m 21 m ✓

         Horizontal Equivalent/Distance/Run = 2,5 cm x 500 (range: 2,4 cm – 2,6 cm)

                        = 1 250 m✓ (Answer must be in meters)

         [Accept any other method to calculate distance. Actual marks for

             measurement and answer.]

         Gradient   = <u>Vertical Interval</u>✓

                          Horizontal Equivalent

            = <u>21m÷21</u>

              1 250÷21✓

            = 1/ 1:59,52 ✓   (Range: 57 – 62)

         [ONLY answer give FULL marks. If answer is incorrect mark steps.]   (5)

4.2.2. Gentle✓   (1)

4.2.3. You need to move 59.52 m✓ horizontally to rise with 1m. ✓   (2)

4.2.4. Contours are far apart✓   (1)

4.2.5. **Area of Rifle Range**

Length   = 2 x 0,5 (range: 1,9 cm – 2,1 cm) ✓

                    = 1 km✓

Breadth   = 0.6 x 0,5 (range: 0.5 cm – 0.7cm) ✓

$$= 0{,}12 \text{ km} \checkmark$$

Area $= 1 \text{ km} \times 0{,}12 \text{ km} \checkmark$

$$= 0{,}12 \text{ km}^2$$

(Range: 0,11 km2 - 0,13 km²) $\checkmark$ (4)

4.4. Orthophoto   map $\checkmark$ (1)

4.4.1 Orthophoto map shows more detail $\checkmark$

Smaller area shown on a large piece of paper $\checkmark$

Greater clarity on orthophoto map $\checkmark$

1:10 000 is a larger scale than 1:50 000 $\checkmark$ (3)

4.5. 22°29'26''S $\checkmark\checkmark$ 30°01'42''E $\checkmark\checkmark$ (4)

OR

22°29,4'S $\checkmark\checkmark$ 30°01,7'E$\checkmark\checkmark$

SESSION NO: 15
TOPIC: MAPWORK INTERPRETATION AND GIS

SECTION B: ANSWERS TO TYPICAL EXAM QUESTIONS ON GIS

Question 2: GIS

2.1. _**Geography Information Systems**_

An organized collection of computer hardware, software,   geographic data, processes and personnel $\checkmark\checkmark$ designed to capture, store, update, manipulate, analyse and display geographically referenced data $\checkmark\checkmark$ (2 x 2 = 4)

2.2.1. True $\checkmark$

2.2.2. True $\checkmark$

2.2.3. True $\checkmark$

2.2.4. False $\checkmark$ (Hardware is the equipment in a GIS)

2.2.5. True $\checkmark$

2.2.6. True $\checkmark$ (6 x 1 = 6)

2.3. Map represent vector $\checkmark$data well as it consist of points, lines and polygons $\checkmark$

The orthophoto consist of pixels that make up an image of geo features$\checkmark$

which is raster data $\checkmark$ (2 x 2 = 4)

2.4. Points: Reservoirs, Buildings, Spot height   Any 2 $\checkmark\checkmark$ (6 x 1 = 6)

Lines: Rivers, Roads, Contour lines, Dam wall, bridge   Any 2 $\checkmark\checkmark$

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Polygons: Cultivated land, Dam   Any 2 ✓✓

QUESTION 2: GIS

[20]

2.1   Identify 2 components and 2 functional elements of GIS.   (4 x 1 = 4)
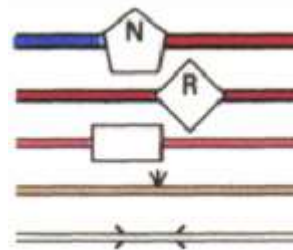Components: **Hardware, Software, People, Data, Methods** ✓✓
Functional Elements:
Store, Update, Capture, Manipulate, Organise, Analyse, Display ✓✓

2.2.   Classify the following pieces of information as mostly spatial or mostly
attribute data.   (2 x 2 = 4)
2.2.1   The classification of different types of roads on the topographic map.
Attribute ✓✓

2.2.2.   The bridges over the Mbizane River
Spatial Data ✓✓

2.3.   Refer to the map clip above of the Mbizane River to answer the question.
2.3.1.   Should the Mbizane River flood, how could GIS be used to avoid harm to the
people living in the area as well as reduce the impact of the flood on the traffic
in the area?   (2 x 2 = 4)
Identify the area that can be flooded / are flooded ✓✓
Identify evacuation routes ✓✓
Places to evacuate to ✓✓
Alternative routes ✓✓
Identify and find routes to nearest hospitals ✓✓
Set up a disaster management plan ✓✓
2.3.2.   Which 2 GIS layers will be essential for the analysis in mentioned 4.3.1.
Rivers ✓✓   **Roads** ✓✓
Terrain / Elevation / Contour model ✓✓
Hospitals / ✓✓
Open land or other places like school to evacuate to ✓✓   (2 x 2 = 4)

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2.4. Which of the following 2 diagrams display raster and vector data respectively and motivate your answer? (4 x 1 = 4)

|		
Raster / Vector	Vector data ✓	Raster data ✓
Motivation	Geographic features are modelled as points, lines, and polygons ✓	Geographic features are displayed as pixels in a satellite / aerial photograph ✓

MAPWORK:

MAPWORK CONSOLIDATION - KIMBERLEY

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MAPWORK ACTIVITY: KIMBERLEY

MAKE USE OF THE EXTRACTS OF THE 1:50 000 TOPOGRAPHIC MAP AND THE 1:10 000 ORTHOPHOTO MAP TO ANSWER THE FOLLOWING QUESTIONS.
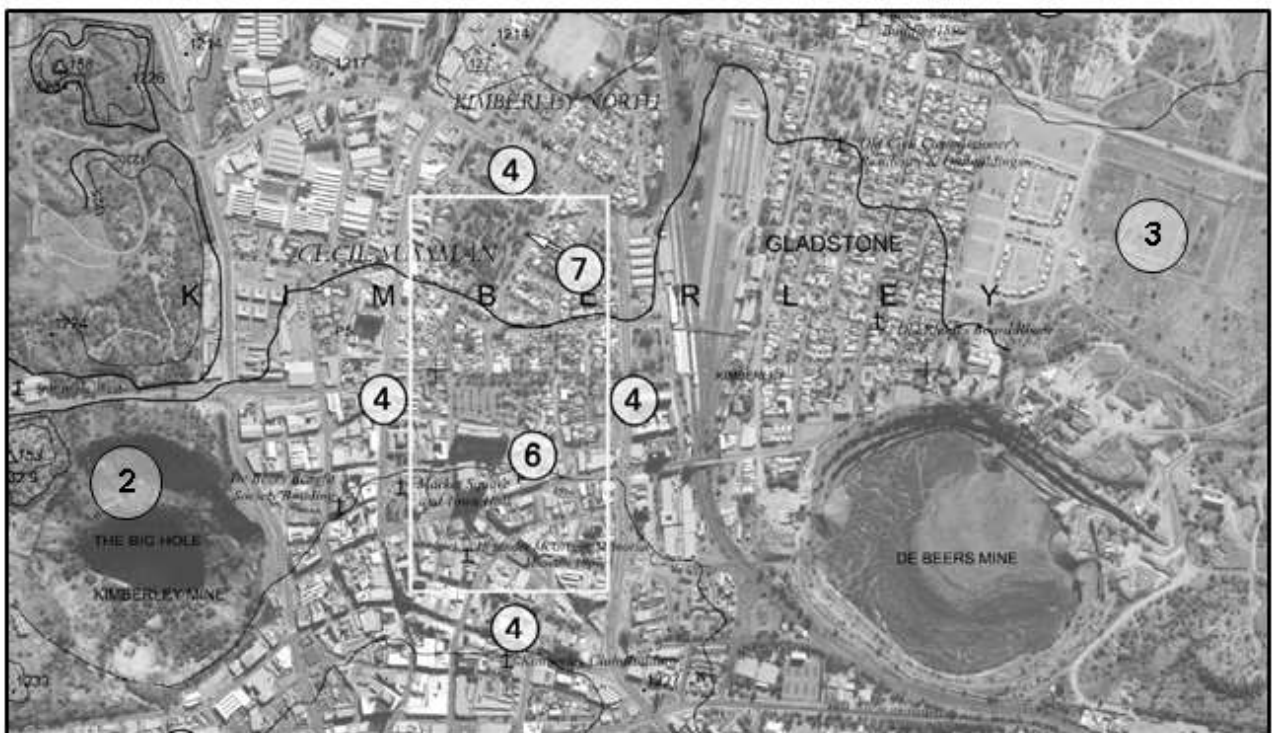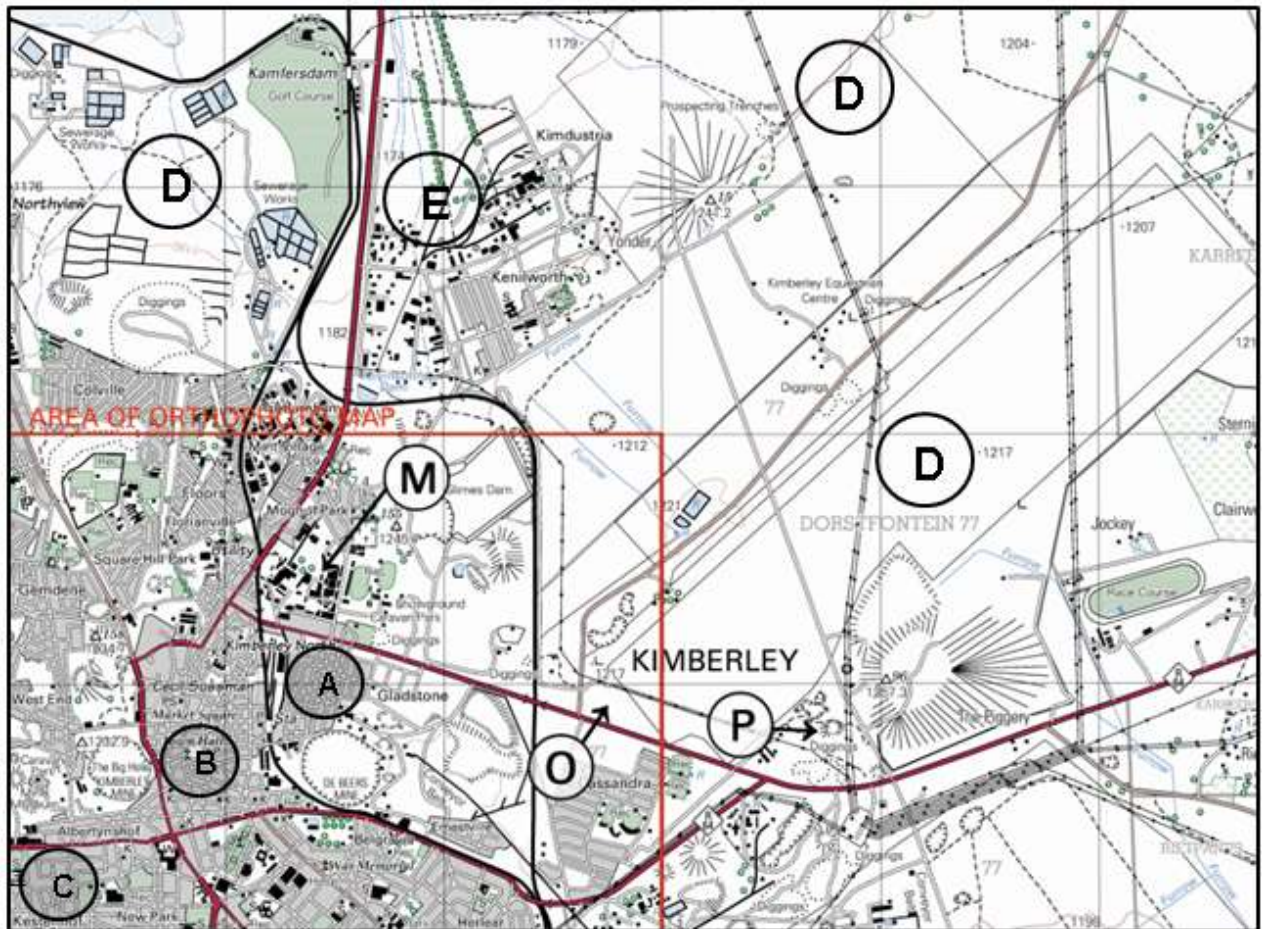
QUESTION 1 – CLIMATE

1.1 Does the mapped area receive a high or a low rainfall? Give TWO reasons to support your answer.

Rainfall: *Low* ✓

(1 x 1) (1)

Reasons: *Sparse vegetation* ✓✓
Few rivers ✓✓
Non-perennial rivers ✓✓
Very little cultivated land ✓✓
[Any TWO]

(2 x 2) (4)

1.2 The temperature at **3** on the orthophoto map is lower than at **7**.

1.2.1 What is this climatic phenomenon called?

Urban heat island ✓✓

(1 x 2) (2)

1.2.2 Provide TWO reasons from the orthophoto map to explain the climatic phenomenon mentioned in QUESTION 1.2.

Tall buildings in the CBD ✓✓
High building density in the CBD ✓✓
Little natural vegetation in the CBD ✓✓
Few water features in the CBD ✓✓
Artificial surfaces (tar, concrete) absorbing heat ✓✓
[Any TWO]

(2 x 2) (4)

QUESTION 2 – GEOMORPHOLOGY

2.1 Provide evidence from the topographic map that the mapped area is flat.

Contour lines very far apart ✓
Spot heights and trigonometrical stations are very similar in height ✓
[Any ONE]

(1 x 1) (1)

2.2 Why is a flat area conducive for the development of infrastructure?

Easy to lay down infrastructure ✓✓
No obstructions to overcome (no need for costly bridges, tunnels) ✓✓
Quicker to construct ✓✓
Save on construction costs ✓✓
[Any TWO]

(2 x 2) (4)

2.3 Give evidence from the orthophoto map that the mapped area has experienced intrusive volcanism in the distant past.

Volcanic pipes have been mined for diamonds ✓✓ (1x2) (2)

QUESTION 5 – GEOGRAPHIC INFORMATION SYSTEM

5.1 Which map is an example of vector data, and which one is an example of raster data?

Topographic map: *Vector* ✓

(1 x 1) (1)

Orthophoto map: *Raster* ✓

(1 x 1) (1)

5.2 Does the orthophoto map have a high or a low resolution? Give ONE reason for your answer.

Resolution: *High* ✓
(1 x 1) (1)

Reason: *Orthophoto map clear* ✓✓
Detail can be seen ✓✓
[Any ONE]

(1 x 2) (2)

5.3 Mention TWO layers of information that a developer has to take into account before considering the site selected for the industrial zone at Kimdustria (**E** on the topographic map).

Geology ✓✓
Hydrology ✓✓
Topography ✓✓
Transport ✓✓
[Any TWO]

(2 x 2) (4)

5.4 Mention how the scale of ONE of the two maps must be manipulated in order for both maps to have the same scale.

Scale of topographic map must be enlarged ✓✓
OR
Scale of orthophoto map must be reduced ✓✓

(1 x 2) (2)

5.5 Explain how the Northern Cape Department of Education can implement GIS to establish the need for the development of a new high school at in Gladstone at **5**.

Obtain information regarding number of learners currently in primary schools ✓✓

Obtain information about the average ages of people living in Gladstone ✓✓

Obtain information regarding the number of high schools in close proximity of Gladstone ✓✓

Accessibility to the proposed site of the new high school ✓✓

[Any TWO] (2 x 2) (4)

[**Total = 33 marks**]