

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2018

**GEOGRAPHY P2
MARKING GUIDELINE**

MARKS: 75

This marking guideline consists of 11 pages.

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

The questions below are based on the 1 : 50 000 topographic map 2530BD MBOMBELA, 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 answer and write only the letter (A–D) in the block next to each question.

- 1.1 The neighbouring country **A** on the general information map on page 3 is ...

A Swaziland.
B Zimbabwe.
C Mpumalanga.
D Mozambique.

D

- 1.2 The map index/reference of the topographic map to the south-east of Mbombela is ...

A 2530 DA.
B 2530 DB.
C 2530 DA.
D 2531 CA.

D

- 1.3 According to the urban hierarchy Mbombela is classified as a ...

A city.
B minor country town.
C hamlet.
D metropolitan.

A

- 1.4 The N4 in blocks **F3**, **F4** and **F5** is found along a ...

A plateau.
B watershed
C river valley.
D interfluve.

C

- 1.5 The feature **1** on the orthophoto map is a ...

A recreational ground.
B research.
C show ground.
D sewerage works.

C

- 1.6 The true bearing of trigonometric station 111 (block **G5**) from spot height 1028 (block **H5**) is ...

A 22°.
B 197°.
C 10°.
D 108°.

A

1.7 Feature **B** on the topographic map is a(n) ...

- A dam.
- B cemetery.
- C embankment.
- D excavation.

B

1.8 The slopes found between **2** and **3** on the orthophoto map indicate a ... slope.

- A concaved
- B terraced
- C convexed
- D steep

C

1.9 Feature **4** on the orthophoto map is a ...

- A shopping centre.
- B factory.
- C hospital.
- D prison.

D

1.10 The man-made feature at 25°24'35"S 30°55'20"E on the topographic map is a ...

- A windmill.
- B power sub-station.
- C factory.
- D trigonometric station.

B

1.11 The land-use zone numbered **5** on the orthophoto map is a ...

- A rural-urban fringe.
- B high-income residential area.
- C central business district.
- D industrial area.

C

1.12 The orthophoto map is an example of a ... photograph.

- A high-angle oblique
- B low-angle oblique
- C horizontal
- D vertical aerial

D

1.13 The man-made feature at **6** on the orthophoto map is a/are ...

- A lighthouse.
- B telephone lines.
- C communication tower.
- D power line.

C

1.14 When travelling in a southerly direction on the **R40** from Mbombela, the next central place settlement will be ...

- A Barberton.
- B Komatipoort.
- C Mataffin.
- D Kaapmuiden.

A

1.15 The N4 passing Mbombela forms part of the ... Spacial Development Corridor.

- A Lebombo
- B Wild Coast
- C Maputo
- D Phalaborwa

C

(15 x 1) (15)
[15]

QUESTION 2: MAPWORK CALCULATIONS AND TECHNIQUES

2.1 Locate points **2** and **3** on the orthophoto map.

2.1.1 (a) Identify the indicator of height at **2**.

Trigonometric beacon ✓ (1 x 1) (1)

(b) State the height at **2**.

696 (m) ✓ (1 x 1) (1)

2.1.2 Calculate the average gradient between point **2** and point **3** on the orthophoto map in metres.

Show ALL calculations. Marks will be awarded for calculations.

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

$VI = 696\text{ m} - 640\text{ m} = 56\text{ m}$ ✓

$HE = 11,4\text{ cm} \times 100\text{ m}$ [range for measurement 11,3 cm to 11,5 cm]

$= 1\ 140\text{ m}$ ✓

Range [1 130 m – 1 150 m]

$G = \frac{56}{1\ 140}$ ✓ (Show division)

$= 1 : 20,35$ or $\frac{1}{20,35}$ ✓

Range [1 : 20,17 – 1 : 20,53]

(5 x 1) (5)

2.1.3 Explain why your answer to QUESTION 2.1.2 indicates a gentle gradient.

The slope rises very gently over a short distance. ✓

For every 20,5 units that you move horizontally, you will rise 1 unit vertically. ✓

The relationship between the difference of the vertical interval and the horizontal equivalent is large. ✓

The ratio is more than 1 : 10 ✓

[Any ONE]

[MARK CONCEPT OF UNDERSTANDING STEEPNESS]

(1 x 1) (1)

- 2.2 Using the information on the topographic map, determine the magnetic declination for 2018. Show ALL calculations. Marks will be awarded for calculations.

Difference in years: 2018 – 2014 = 4 years ✓

Mean annual change: 5' W ✓ [(W) must be included]

Total change: 4 x 5' W = 20' W ✓

Magnetic declination for 2018: 18° 12' W + ✓ 20' W = 18° 32' W ✓

(5 x 1) (5)

- 2.3 Refer to the area demarcated in RED on the topographic map, which represents the area covered by the orthophoto map.

- 2.3.1 Calculate the above area. Show ALL calculations. Marks will be awarded for calculations.

Measurement range: length – 9,9 cm to 10,1 cm / 99 mm to 101 mm

*breadth – 7,2 cm to 7,4 cm / 72 mm to 74 mm
[Accept any units]*

Area = length x breadth

= (10,0 cm ✓ x 0,5) km x (7,3 cm ✓ x 0,5)

= 5,0 km ✓ x 3,65 km ✓ (4,95 km to 5,05 km x 3,6 km to 3,7 km)

= 18,25 km² ✓

(Range is 17,82 km² to 18,69 km²)

NOTE: *[Final answer in km²]*

(5 x 1) (5)

- 2.4 Would the orthophoto map have a smaller or larger scale when compared to the topographic map? Give a reason for your answer.

Answer: Larger ✓

Explain: The scale of the topographic map is smaller ✓

The scale of the orthophoto map is 1 : 10 000 and the scale of the topographic map is 1 : 50 000 ✓

The scale of the orthophoto map is five times larger than that of the topographic map ✓

The scale of the topographic map is five times smaller than that of the orthophoto map ✓

[Any ONE]

(2 x 1) (2)

[20]

QUESTION 3: APPLICATION AND INTERPRETATION

3.1 Mbombela is situated alongside the Umgwenya River.

3.1.1 Name ONE physical feature that would hinder a canoeist (someone using a small canoe) going downstream between **C** and **D** on the topographic map.

Physical: *Weir* ✓

Umgwenya Waterfall / Waterfall ✓

[Any ONE]

(1 x 1) (1)

3.1.2 Give a reason for your answer in QUESTION 3.1.1.

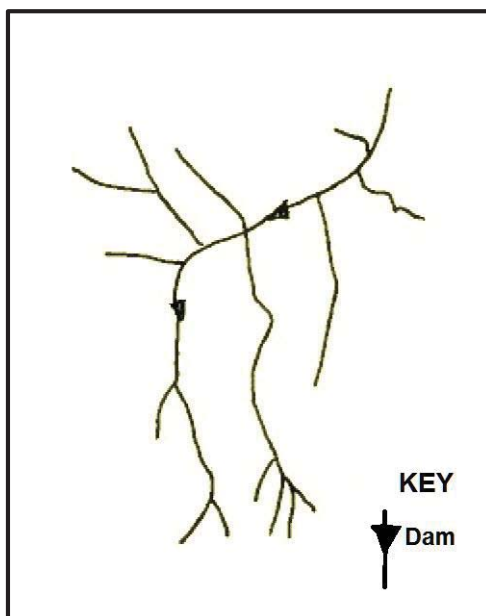
Explain: *Weir – Knickpoint / alters flow characteristic of river / changes height level of river causing a danger* ✓✓

Waterfall – Water flows over vertical drop causing a danger ✓✓

[Any ONE]

(1 x 2) (2)

3.2 Refer to block **H3, I3** and the sketch below.



3.2.1 Name the stream pattern evident in this basin.

Dendritic ✓

(1 x 1) (1)

3.2.2 State TWO characteristics of the stream pattern identified in QUESTION 3.2.1.

Branches like a tree ✓

Distinct interfluvies ✓

The angle at which tributaries join is acute ✓

[Any TWO]

(2 x 1) (2)

- 3.2.3 Complete the table below to show the number of tributaries for each stream order.

Stream order	1	2	3
Number of tributaries	14	3 ✓	1 ✓

(2 x 1) (2)

- 3.2.4 Identify the type of river in this basin.

Non-perennial ✓

(1 x 1) (1)

- 3.3 Refer to the Riverside Industrial Park labelled **E** (blocks **F8**, **G8**) on the topographic map.

- 3.3.1 What is an *industrial park*?

Area planned for industrial development, which often has offices and light industry, rather than heavy industry. ✓ [Concept]

(1 x 1) (1)

- 3.3.2 What are the economic benefits of the Riverside Industrial Park for Mbombela and its location?

Close to the transport route N4/railway line Maputo Corridor ✓✓
Mbombela gets funding from the national government for the SDI ✓✓
Infrastructure in one place ✓✓
Attracts new industry to one location ✓✓
Job opportunities created ✓✓
Boosts the economy of the city ✓✓ [Any TWO]

(2 x 2) (4)

- 3.4 Identify the following features labelled **7** and **8** on the orthophoto map.

7: Orchard / vineyard e.g. citrus ✓

8: Railway station ✓

(2 x 1) (2)

3.5 The original N4 indicated in blocks **G8**, **H9** and **H10** has been deviated (re-routed) to the north of Mbombela.

3.5.1 Explain why the N4 had to be deviated in order to go around the city.

To avoid traffic congestion in the city ✓✓

Reduce noise and air pollution ✓✓

CBD could not handle the large volume of traffic ✓✓

Damage to roads due to increase of traffic volumes ✓✓

N4 now quicker in linking Johannesburg to Maputo

Need to reach destination faster ✓✓

Reduce accident rate/safer route ✓✓

Buildt around an already established settlement ✓✓

[Any TWO]

(2 x 2)

(4)

3.6 Refer to Mataffin residential area in block **G6** on the topographic map.

3.6.1 Identify the street pattern of this land-use area.

Planned-irregular ✓

(1 x 1)

(1)

3.6.2 Discuss ONE advantage and ONE disadvantage of the street pattern identified in QUESTION 3.6.1.

Advantages:

Free flow of traffic ✓

Fewer traffic jams ✓

Scenic drive ✓

Follows the contour lines ✓

Saves petrol ✓

Saves time ✓

[Any ONE]

(1 x 2)

(2)

Disadvantages:

Get lost easily ✓

Lost people vulnerable to crime ✓

Difficult to develop infrastructure ✓

Difficult to lay-out ✓

Many cul-de-sacs ✓

[Any ONE]

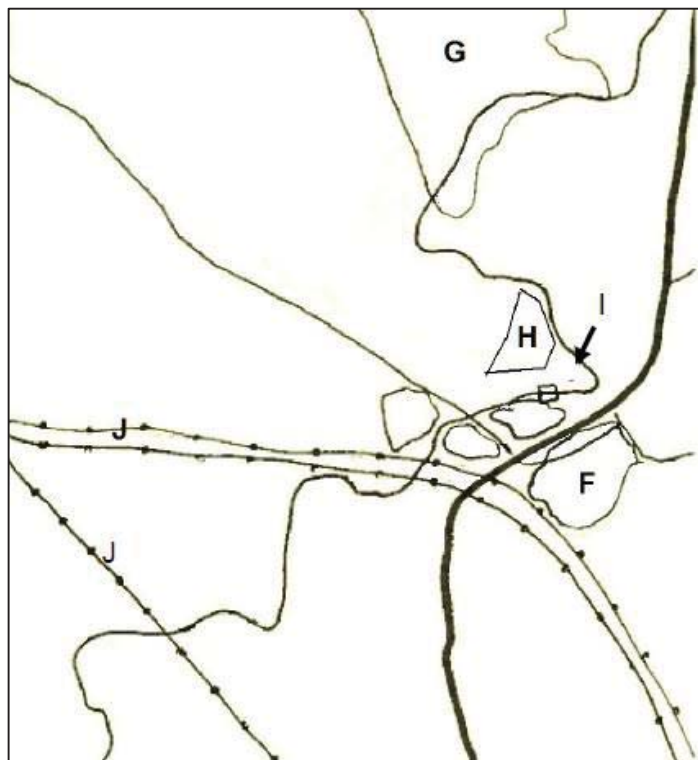
(1 x 2)

(2)

[25]

QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

- 4.1 The following is a freehand sketch map of the area covered by the topographic map in blocks **A 8, 9, 10 / B 8, 9, 10** and **C 8, 9, 10**.



- 4.1.1 Identify the features **H, I and J** in the sketch as either a point, line or polygon.

H: Woodland – polygon ✓

I: Railway station – line ✓

J: Powerline – line ✓

(3 x 1) (3)

- 4.1.2 Give ONE advantage of using vector data.

Line, points and polygons are shown correctly. ✓✓

Needs less storage space for data in the disk. ✓✓

Lines and polygons fit together correctly. ✓✓

[Any ONE]

(1 x 2) (2)

- 4.1.3 Use the topographic map and identify the following features on the sketch map.

Key: **F:** Curlew ✓

G: Phumlani ✓

(2 x 1) (2)

4.1.4 State the spatial position of Curlew from Phumlani.

South / South East / South South East ✓

(1 x 1) (1)

4.2 Refer to block **F5** and **F6** on the topographic map. the local district municipality has decided to do an environmental impact study to evaluate the influence a rubbish dump would have on the area.

4.2.1 Mention ONE way in which data can be collected to do an environmental impact study.

Surveys / Questionnaires ✓

Photographs ✓

Remote sensing/satellite images ✓

Testing of natural environment e.g. testing soil and water quality ✓

Physical measurements using secondary data ✓

Using existing maps ✓

[Any ONE]

(1 x 1) (1)

4.2.2 Identify TWO visible layers in block **F6** that a GIS specialist would use to evaluate the suitability of the dump site.

Relief / Slope / Gradient / Geology ✓

Infrastructure: Roads / Railway line ✓

Drainage / Rivers / Water ✓

[Any TWO]

(2 x 1) (2)

4.2.3 Give a reason for each of the answers to QUESTION 4.2.2.

Relief:

Slope needs to be flat for dumping ✓✓

Soils must be suitable to prevent leaching ✓✓

Suitable geological rock needed ✓✓

Slope must be minimal which has infrastructural advantages and reduces environmental impacts ✓✓

Infrastructure:

Ensuring heavy vehicles would not damage roads ✓✓

Quick access to city and surrounding areas ✓✓

Dump close to transport routes – economic costs / close to Mbombela ✓✓

Drainage:

Minimal seepage into underground system – water pollution / contamination ✓✓

[Any TWO]

(2 x 2) (4)

[15]

TOTAL: 75