**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

GEOGRAPHY P2

MARKING GUIDELINE

PREPARATORY EXAMINATION

SEPTEMBER 2019

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 2930CB of PIETERMARITZBURG as well as the 2930CB 8 PIETERMARITZBURG (North) orthophoto map 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 National Freeway that passes through Pietermaritzburg is the ...

   A   N1.
   B   N2.
   C   N3.
   D   N4.

   C✓

1.2   The harbour that is situated closest to Pietermaritzburg is ...

   A   Richards Bay.
   B   East London.
   C   Durban.
   D   Port Elizabeth.

   C✓

1.3   If you were travelling north on the R33 from Allandale (block **D10)**, you would reach the town of …

   A   New Hanover.
   B   Harrismith.
   C   Howick.
   D   Merrivale.

   A✓

1.4   The location of the woodlands at Sweet Waters in block **F1** was influenced by the …

   A   radiation fog.
   B   frost pocket.
   C   thermal belt.
   D   slope aspect.

   D✓

1.5   The … in blocks **F/G 11** suggests that Pietermaritzburg is managing its
        water resources efficiently.

        A   purification plant.
        B   sewerage works.
        C   reservoir.   **A**✓
        D   perennial water.

1.6   The main purpose of the weir in block **H7** is to …

        A   prevent soil erosion.
        B   control veld fires.
        C   control water flow.   **C**✓
        D   control water usage

1.7   The land-use zone in block **D9** on the topographical map is known as
        the … zone.

        A   residential
        B   transition
        C   industrial   **A**✓
        D   commercial

1.8   The human-made feature in block **D1** that suggests that the area is prone
        to fires.

        A   windpump
        B   firebreak
        C   power line   **B**✓
        D   perennial water

1.9   The grid reference of Gordan Falls in block **H2** is …

        A   29°37'28"S and 30°16'34"E / 29° 37,5'S and 30° 16,6'E
        B   29°37'28"E and 30°16'34"S / 29° 37,5'E and 30° 16,6'S
        C   30°16'34"S and 29°37'38"E / 30° 16,6'S and 29° 37,6'E   **A**✓
        D   30°16'34"E and 29°37'38"S / 30° 16,6'E and 29° 37,6'S

1.10   The human-made feature at **2** on the orthophoto is a …

        A   industrial park.
        B   office park.
        C   veterinary clinic.   **D**✓
        D   shopping mall.

1.11   Pietermaritzburg is situated along the National Freeway between the
… core industrial area.

    A   Durban-Pinetown and South West Cape.
    B   Durban-Pinetown and PWV(Gauteng).
    C   PWV(Gauteng) and South West Cape.
    D   PWV(Gauteng) and Port Elizabeth Uitenhage.

B✓

1.12   The true bearing of the trigonometrical station **243** in block **C6** from spot
height 1106 in block **C6** is …

    A   149º
    B   329º
    C   30º
    D   200º

A✓

1.13   The straight-line distance from benchmark **681.5** in block **H10** to
trigonometrical station **250** in block **H11** on the topographical map is …

    A   1.55 m.
    B   3.1 km.
    C   310 m.
    D   1.55 km.

D✓

1.14   The economic activity at **U** in block **A12** is a … activity.

    A   primary
    B   secondary
    C   tertiary
    D   quaternary

B✓

1.15   The dominant street pattern in block **G8** is …

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

D ✓

(15 x 1) **[15]**

QUESTION 2: MAPWORK TECHNIQUES AND CALCULATIONS

2.1   Refer to the Index to sheets on the topographical map when answering the questions below.

      2.1.1   In the map index of 2930, the **30** represents …

          (b)   30° east of Greenwich Meridian ✓   (1 x 1) (1)

      2.1.2   Give the map reference code of the topographical map to the south of the 2930 AC map.
              2930CA ✓ **/ 2930 CC**√   (1 x 1) (1)

2.2   Calculate the magnetic declination for the current year (2019).
        Marks will be awarded for calculations.

Difference in years	=	**2019 – 2016 = 3 years** ✓
Annual change	=	**9'** ✓ **west**
Total annual change	=	**9' x 3 = 27'** ✓
Magnetic declination for 2019	=	**24°45' +** ✓ **27'**
		24°72'
		25°12' west of true north ✓
		(no direction, no mark)

          (5 x 1) (5)

2.3

      2.3.1   Refer to the demarcated area in RED on the topographical map which represents the area covered by the orthophoto map. Use the demarcated area to calculate the surface area of the orthophoto map in km². Show ALL calculations. Marks will be awarded for calculations.

              Formula: **Area = length x breadth**

              Length = 9.6 ✓ **cm x 0.5 = 4.8 km   (range: 9.5 – 9.7)**

              Breadth = 6.5 ✓ **cm x 0.5 = 3.25 km   (range: 6.4 – 6.6)**

              Area   = 4.8 ✓ **x 3.25 km** ✓
                          = 15.6 km² ✓

              Range for answer (15.20 – 16.0)   (5 x 1) (5)

2.3.2 Why is the orthophoto map larger than the same area demarcated on the topographical map?

Orthophoto maps scale is 5 times larger than the scale of the topographical map ✓
1:10 000 is a larger scale than 1:50 000 ✓
(ANY ONE)   (1 x 1) (1)

2.4

2.4.1 Calculate the average gradient between spot height 1106 (**R**) in block **C6** and the trigonometrical station **243** in block **C6** on the topographical map.
Show ALL calculations. Marks will be awarded for calculations.

Formula: Average gradient =   <u>Vertical interval</u>
                                    Horizontal equivalent

VI = 1148.8 – 1106 = 42.8 ✓**m**

HE = 2cm x 500   = 1000✓**m (2cm x 0.5 = 1km x 1000 = 1000m)**
                                    Measurement range (1.9cm – 2.1cm)

<u>VI</u> = <u>42.8</u> ✓
HE = 1000

         =   <u>1</u> ✓
              23.36

         = 1: 23.36 ✓

(Range: 1:22 -1: 25)   (5 x 1) (5)

2.4.2 Explain your answer to QUESTION 2.4.1.

The land rises by 1m for every 23.36 m horizontal distance covered ✓   (1 x 1) (1)

2.4.3 Classify the average gradient you calculated as steep or gentle.

gentle✓   (1 x 1) (1)

                                                                              [20]

QUESTION 3: APPLICATION AND INTERPRETATION

3.1 A motorist is travelling in a south-easterly direction on the N3 from Hilton Gardens in block **C4** on the topographical map**.** They recorded a temperature of 23**°** C on the dash board thermometer display at the start of the journey. A temperature of 27**°** C was recorded as they passed Willowton in blocks **F9** and **F10**.

    3.1.1 Calculate the difference in temperature between Hilton Gardens and Willowton.

         4° C ✓   (1 x 1) (1)

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

         <u>**Hilton Gardens**</u>

         Away from the CBD ✓✓
         Fewer roads ✓✓
         Residential area ✓✓
         Greater amount of vegetation. More evapotranspiration ✓✓
         Fewer cars, less pollution ✓✓

         <u>**Willowton**</u>

         Heavy Industrial area ✓✓
         Heavy machinery used in industries ✓✓
         Heavy vehicles /trucks use the area ✓✓
         Lacks vegetation to absorb the heat ✓✓
         More cars, more traffic congestion, more pollution ✓✓
         (ANY TWO)   (2 x 2) (4)

3.2 Pietermaritzburg is situated in a valley. Describe **ONE** climatological disadvantage for the people living in the valley of Pietermaritzburg.

     Cold air drains into the valley resulting in very cold conditions at night and especially winter ✓✓
     The thermal belt will trap pollution ✓✓
     Area could experience frost conditions ✓✓
     Area could experience fog which could reduce visibility and cause accidents ✓✓
     Smog could result from the fog and smoke from the industries ✓✓
     Possibility of acid rain can damage property and plants ✓✓
     (ANY ONE)   (1 x 2) (2)

3.3   Refer to the demarcated area **M** in blocks **B10** and **B11** on the
       topographical map.

      3.3.1   Identify the drainage pattern that dominates the area.

            Trellis ✓   (1 x 1) (1)

      3.3.2   Explain why the drainage pattern identified in QUESTION 3.3.1
            developed in the area.

            Folded sedimentary ✓✓
            Steep sloped – smaller tributaries feed into main stream ✓✓
            Tributaries erode a valley at right angles ✓✓
            Alternate hard and soft rock ✓✓
            (ANY ONE)   (1 x 2) (2)

      3.3.3   Is the drainage density of the area high or low? Give a reason for
            your answer.

            Drainage density: **low** ✓

            Reason: **Few streams evident** ✓✓
                        Permeable rocks ✓✓
                        Vegetation traps water ✓✓
                        (ANY ONE)   (1 + 2) (3)

3.4   Compare the settlement **L** in block **B9** and the settlement north of **S**
     in block **D4** on the topographical map**.** Complete the table using
    the criteria below.

Criteria	Settlement L	Settlement north of S
Settlement pattern	**Dispersed / isolated** ✓	**Nucleated / clustered** ✓
Service provided	**Reservoir** ✓ **water** ✓ **other road** ✓ **transport** ✓ **Any ONE**	**Post office** ✓ **electricity** ✓ **church** ✓ **school** ✓ **other road** ✓ **transport** ✓ **Any ONE**
Dominant primary activity carried out	**Farming** ✓	**farming / forestry** ✓

                                                              (6 x 1) (6)

3.5

    3.5.1   Give **TWO** pieces of evidence from the topographical map to suggest that Pietermaritzburg has a rich historical heritage.

           Voortrekker Museum ✓
           Voortrekker Wagon Trail ✓
           Old Government House ✓
           Garden of Remembrance ✓
           Victoria Oudstehuis 1840 ✓
           Macrorie Museum ✓
           Worlds View / Monument ✓
           (ANY TWO)   (2 x 1) (2)

    3.5.2   Explain the positive impact of this rich historical heritage mentioned in QUESTION 3.5.1 on the local economy of the area.

           Attract tourist/boost tourist industry ✓✓
           Increase economy ✓✓
           Increase in investments ✓✓
           Job opportunities ✓✓
           Improved infrastructure/ improvement in transport and services ✓✓
           Greater buying power ✓✓
           More employed, more spending ✓✓
           Local small businesses develop ✓✓
           Handcraft sales to tourists ✓✓
           (ANY TWO)   (2 x 2) (4)

           [25]

QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

4.1   South Africa recently held an important election in May 2019. The Independent Electoral Commission (IEC) in Pietermaritzburg successfully made use of various data layers stored in their database to plan for this election.

        4.1.1   Define the term *database.*

                It is a storage/collection of data/information that is organized so that it can be easily accessed/updated in a central plan ✓ [Concept]   (1 x 1) (1)

        4.1.2   The IEC in Pietermaritzburg used the orthophoto maps stored in the council's database to examine the prospective voting stations. Give **TWO** reasons why the orthophoto map was chosen over the topographical map for this purpose.

                The orthophoto map has a good spatial resolution ✓✓
                High degree of clarity ✓✓
                Greater detail ✓✓
                The orthophoto map is a photo/real image of an area/realistic view ✓✓
                It gives a clear plan view of an area ✓✓
                It gives updated information ✓✓
                The local community data base will have updated information ✓✓
                The orthophoto has a larger scale and features will be larger and clearer ✓✓
                (ANY TWO)   (2 x 2) (4)

        4.1.3   To which component of GIS does the orthophoto map belong?

                Data ✓   (1 x 1) (1)

4.2   The city council of Pietermaritzburg conducted a census prior to the elections to acquire necessary data for the elections. A census is an official survey of the population of a country that is carried out in order to find out how many people live there and to obtain details such as peoples ages and jobs.

        4.2.1   Is a census a primary or secondary data source?

                Primary ✓   (1 x 1) (1)

        4.2.2   Give a reason for your answer to QUESTION 4.2.1.

                Information is gained from direct observation/interview ✓✓   (1 x 2) (2)

                                      Please Turn Over

4.2.3 Name the instrument used by the Census Enumerators (those who gather the information) to locate places that they were not familiar with in Pietermaritzburg.

GPS/ Global Positioning System ✓   (1 x 1) (1)

4.3

4.3.1 Suggest **ONE** data layer found on a topographical map that could have been used in determining the location of voting stations in the area*.*

Population density ✓
Transport/accessibility to stations ✓
Distribution of rural and urban people ✓   (1 x 1) (1)
(ANY ONE)

4.3.2 Explain how the process of data security assisted in ensuring that information obtained during the elections was protected.

Limited network sharing to authorized individuals ✓✓
Development of a data security plan or policy ✓✓
Creation of read-only access to files ✓✓
Development of strong passwords ✓✓
Enabled specific codes to access files ✓✓
(ANY TWO)   (2 x 2) (4)

[15]

TOTAL MARKS: 75