education

Department:
Education
PROVINCE OF KWAZULU-NATAL

NATIONAL SENIOR CERTIFICATE

GRADE 12

GEOGRAPHY P2

COMMON TEST

MARKING GUIDELINE

JUNE 2019

MARKS: 75

This marking guideline consists of 12 pages.

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

The questions below are based on the 1:50 000 topographical map (2930CB PIETERMARITZBURG) as well as the 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 map index/reference of the orthophoto map to the south of Pietermaritzburg is …

A 2930CD.
B 2930CB13.
C 2930CB3.
D 2930DA.

B ✓

1.2 The direction of the residential area Raisethorpe in block D 10/11 from Northdale in block D 9 is..

A east north east.
B east.
C west south west.
D west.

B ✓

1.3 The terrain (landscape) of the CBD of Pietermaritzburg in the south east of the orthophoto map can be best described as…

A steep
B terraced
C gentle
D mountainous

C ✓

1.4 The human made feature **7** on the orthophoto map is a …

A museum.
B shopping centre.
C observatory.
D police station.

B ✓

1.5 The height of the reservoir on Town Hill in block **F7** is … metres.

A 836.3
B 251
C 800
D 816.9

A ✓

1.6 The contour interval on the orthophoto map is … metres.

A 5
B 10
C 15
D 20

A ✓

1.7 The Mabane river that flows down a steep gradient from the Gordon Falls is dominated by … flow.

A turbulent
B laminar
C straight
D meandering

A ✓

1.8 The type of infrastructure found at **Q** on the topographical map is a …

A railway.
B main road.
C national freeway.
D pipe line.

C ✓

1.9 The land-use zone in block **F/G 11/12** on the topographic map in which the purification plant is located is known as the …

A industrial zone.
B zone of decay.
C rural-urban fringe.
D commercial zone.

C ✓

1.10 The predominant (major) street pattern at Copesville in blocks **D11/12** on the topographic map is …

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

B ✓

1.11 The type of farming activity being practised at New England in block **H12** is… farming.

A crop
B fruit
C stock
D poultry

A ✓

1.12 The economic activity at **S** in block **D4** on the topographic map is a ... activity.

A primary
B secondary
C tertiary
D quatenary

A ✓

1.13 The straight-line distance from trigonometrical station **263 (J)** in block **D7** to spot height **1031(K)** in block **B6** on the topographic map is …km.

A 6.75
B 3.35
C 4.45
D 2.46

B ✓

1.14 A tourist travelling on the **N2** in a north westerly direction from Pietermaritzburg will reach ….which is 200km away.

A Durban
B Howick
C Harrismith
D Ladysmith.

C

TECHNICAL ERROR

1.15 The orthophoto map was last edited in …

A 2003
B 2004
C 2013
D 2016

A ✓

(1 x 14) **[14]**

QUESTION 2: MAPWORK TECHNIQUES AND CALCULATIONS

2.1 Refer to both the topographic map and the orthophoto map when answering the questions below.

2.1.1 Which map, the topographic map or the orthophoto map, has a larger scale?

orthophoto map ✓ (1 x 1) (1)

2.1.2 Give ONE reason to support your answer to QUESTION 2.1.1.

Orthophoto maps scale is 5 times larger than the scale of the topographic map ✓
Features are larger compared to the topographic map ✓
1:10 000 is a larger scale than 1:50 000 ✓
[Any ONE] (1 x 1) (1)

2.1.3 Give the grid reference of the isolated farmstead at Surrey Farm in block **E11**.

$29^0$34'10" S [8" to 12"] ✓ ***30^0 25'51"E [49" to 53"]*** ✓ (2 x 1) (2)

2.2 Refer to trigonometrical station 103 at Signal Hill in block **H6** and spot height 789 in block **G5**.

2.2.1 Give the true bearing of trigonometrical station 103 from spot height 789.

147^0 ✓ ***[Range 146^0 to 148^0]*** (1 x 1) (1)

2.2.2 Is there intervisibility between trigonometrical station 103 and spot height 789?

Yes ✓ (1 x 1) (1)

2.2.3 Give a reason for your answer to QUESTION 2.2.2.

There are no obstructions /obstacles between trigonometrical station 103 and spot height 789 ✓ (1 x 1) (1)

2.2.4 Calculate the average gradient between trigonometrical station 103 and spot height 789. Show ALL calculations. Marks will be awarded for calculations.

Formula: $\textbf{Gradient} = \frac{\textbf{vertical interval (VI)}}{\textbf{horizontal equivalent (HE)}}$

VI = 895.4 m – 789 m
= 106.4 m ✓

HE = 3.4 cm x 500 ✓
[Range 3.3cm – 3.5cm
= 1700 m ✓
[Range 330m – 350m]

G = $\frac{106.4}{1700}$ ✓

[Mark allocated for substitution]

= $\frac{1}{15.97}$
= 1: 15.97 ✓

OR

VI = 895.4 m – 789 m
= 106.4 m ✓

HE = $\frac{3.4\text{ cm x }50\,000}{100}$ ✓
= 1700 m ✓

G = $\frac{106.4}{1700}$ ✓

= $\frac{1}{15.97}$
= 1: 15.97 ✓

Range [1 : 15.5 to 16.45] (5 x 1) (5)

2.2.5 Explain your answer to QUESTION 2.2.4.

For every 1 unit vertically we move 15.97units horizontally ✓✓
Small ratio between height and distance ✓✓
[Any ONE] (1 x 2) (2)

2.3 A cross section is drawn along the Voortrekker Wagon Trail between points **O** and **P** on the topographical map.
Assume that the vertical scale is 1cm represents 20m.

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

Formula: ***VE = VS÷HS***

1cm = 20 m ✓ (therefore 20m= 20 x 100 = 2000 ✓)

$$VE = \frac{1}{2000} \div \frac{1}{50000} \checkmark$$

$$= \frac{1}{2000} \times \frac{50000}{1} \checkmark$$

$$= \frac{50}{2}$$

= 25 times ✓ (5 x 1) (5)

2.3.2 Provide ONE reason why the vertical scale in a cross section is 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 ✓ (1 x 1) (1)
[Any ONE]

[20]

QUESTION 3: APPLICATION AND INTERPRETATION

3.1 Study the table below showing temperatures for the area **4** and **8** on the orthophoto map and answer the questions.

Area	**4**	**8**
Average summer temperatures	19°	28°

3.1.1 Calculate the difference in temperature between **4** and **8**.

9° C/ 9°✓ (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 8 is the Industrial Zone ✓✓
Area 8 is made up of artificial surfaces that absorb and radiate heat (concrete, steel, tar) ✓✓
Area 8 lacks vegetation to absorb the heat ✓✓
Large space occupied by building traps heat ✓✓
More heavy vehicles produces more heat ✓✓

Area 4 is away from the Industrial Zone ✓✓
Fewer roads. ✓✓
Greater amount of vegetation. More evapotranspiration ✓✓
Close to the river. Cooling effect ✓✓
Fewer cars, less heat produced ✓✓ (2 x 2) (4)
(ANY TWO)

3.2 With reference to rainfall.

3.2.1 Does Pietermaritzburg receive seasonal or perennial rainfall?

Seasonal ✓ (1 x 1) (1)

3.2.2 Give ONE point of evidence from the topographic map to support your answer to QUESTION 3.2.1

Number of non-perennial rivers ✓
Numerous dams ✓
Presence of reservoirs ✓ (1 x 1) (1)

3.3 Refer to block **A 2/3**

3.3.1 State the general flow direction of the Gwen's Spruit (river) in block **A 2/3**.

North/Northerly✓ (1 x 1) (1)

3.3.2 Using map evidence give ONE reason from the topographic map for your answer to QUESTION 3.3.1.

Dam wall facing northerly direction/dam wall is north of the dam ✓✓
Contour line crossing the river, forms "v" pointing south therefore the river flows north ✓✓
Higher-lying ground in the south ✓✓
Spot height readings decrease towards north ✓✓ (1 x 2) (2)
[Any ONE]

3.4 Refer to the drainage pattern in block **I 12**.

3.4.1 Identify the drainage pattern in block **I 12**.

Trellis/Dendritic✓ (1 x 1) (1)

3.4.2 State the underlying rock structure associated with this drainage pattern, answer to QUESTION 3.4.1.

Trellis

Folded sedimentary✓
Tributaries erode a valley at right angles✓
Alternate hard and soft rock✓
[Any ONE]

OR

Dendritic

Uniform rocks/equal resistance to erosion ✓ (1 x 1) (1)

3.5 If Pietmaritzburg had to experience extremely high rainfall over a short period of time, explain how the amount of vegetation would influence the chances of flooding in the north western section of the city.

Reduce the chances of flooding✓✓ (1 x 2) (2)

3.6 The residential area **6** on the orthophoto map is a high-income residential area. Give ONE piece of evidence from the orthophoto map to support this statement.

Away from the industries and CBD ✓✓
Near the recreational facilities ✓✓
Larger houses ✓✓
Larger plots / low density ✓✓
Larger stands ✓✓
More trees ✓✓
Good views ✓✓
[Any ONE] (1 x 2) (2)

3.7 Refer to the land use zone **8** on the orthophoto map**.**

3.7.1 Identify the land-use zone.

Industrial zone ✓

(1 x 1) (1)

3.7.2 Describe **TWO** factors that may have influenced the location of the land-use zone

The land is flat ✓
Land is cheap ✓
Close to transport ✓***routes- road and rail*** ✓
Open space for further expansion ✓ (2 x 1) (2)
[Any TWO]

3.7.3 Suggest TWO problems the residents of the settlement next to the land-use would experience.

Air pollution/noise pollution/water pollution ✓
Acid rain ✓
Respiratory problems ✓
Traffic congestion ✓
[Any TWO] (2 x 1) (2)

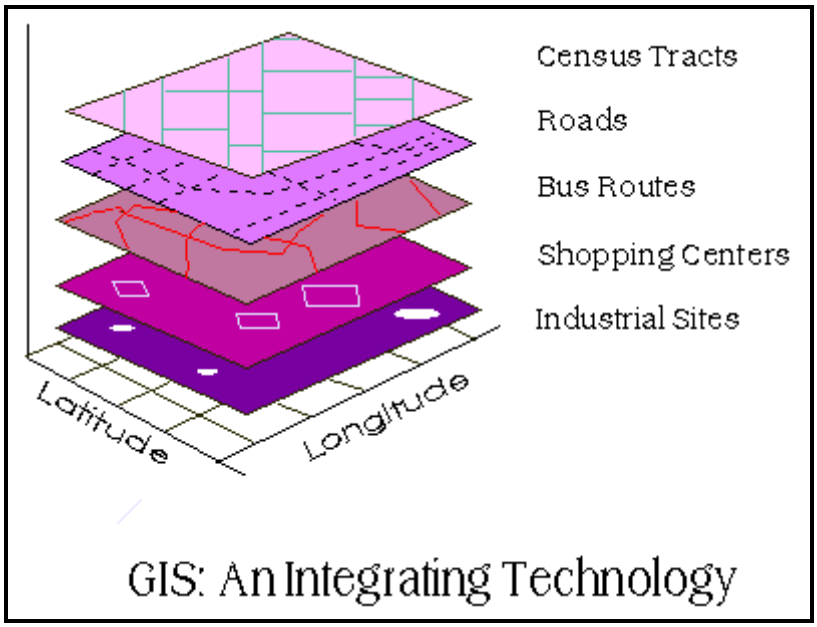
3.8 Evaluate possible environmental injustices that could have been caused by the excavation occurring at **S** in block **D4**

Unhealthy environment can lead to spread of diseases ✓✓
Destruction of natural vegetation could cause the extinction of flora and fauna ✓✓
Destroys ecosystem/biodiversity/habitat ✓✓
Soil erosion could result in siltation of dams and the choking of rivers ✓✓
Destroys aesthetic appeal of the environment ✓✓
Scars the land causing environmental despoliation ✓✓
Mass movement in the form of landslides may occur ✓✓
[Any TWO] (2 x 2) (4)

[25]

QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

The diagram below illustrates the concept of data layering. Study the diagram carefully and answer the questions that follow.



4.1 Define the term *data layering*.

The placing of different layers of data on top of one another ✓
Different types of information that are projected onto one another ✓
[Concept] (1 x 1) (1)

4.2 Refer to the shopping centre labelled **2** on the orthophoto map.

4.2.1 List TWO types of data related to accessibility of the shopping centre from the above diagram.

Roads ✓
Bus routes ✓ (2 x 1) (2)

4.2.2 With reference to the data types identified in QUESTION 4.2.1 explain how the business partners of Pietermaritzburg used these data layering information to decide on this site for the construction of the shopping centre.

The roads will make the shopping centre very accessible ✓✓
The bus route will assist in transporting more customers to the shopping centre ✓✓ (2 x 2) (4)

4.3 An urban and regional planner is concerned about the impact that urban sprawl may have in the eastern section of Pietermaritzburg.

4.3.1 Give the term used in GIS where questions are asked about a relevant geographical issue.

Data Querying/ Querying ✓ (1 x 1) (1)

4.3.2 State and explain the GIS process that an urban and regional planner would use to limit the impact of urban sprawl in this area.

Buffering ✓***: Demarcating an area around a feature***
(Concept) ✓✓ (1 + 2) (3)

4.3.3 Suggest how the GIS process identified in QUESTION 4.3.2 will impact positively on the primary activities in Pietermaritzburg.

Prevent invasion of the farmland ✓✓
Reduce the impact of food insecurity ✓✓ (2 x 2) (4)
[15]

TOTAL MARKS: 74

PLEASE NOTE:
DUE TO THE TECHNICAL ERROR IN QUESTION 1.14 THE TOTAL FOR THE PAPER HAS BEEN ADJUSTED TO 74.
EDUCATORS NEED TO CONVERT THE MARK TO 75
FORMULA: LEARNER MARK DIVIDED BY 74 X 75