



EXAMINATIONS AND ASSESSMENT CHIEF DIRECTORATE

Home of Examinations and Assessment, Zone 6, Zwelitsha, 5600

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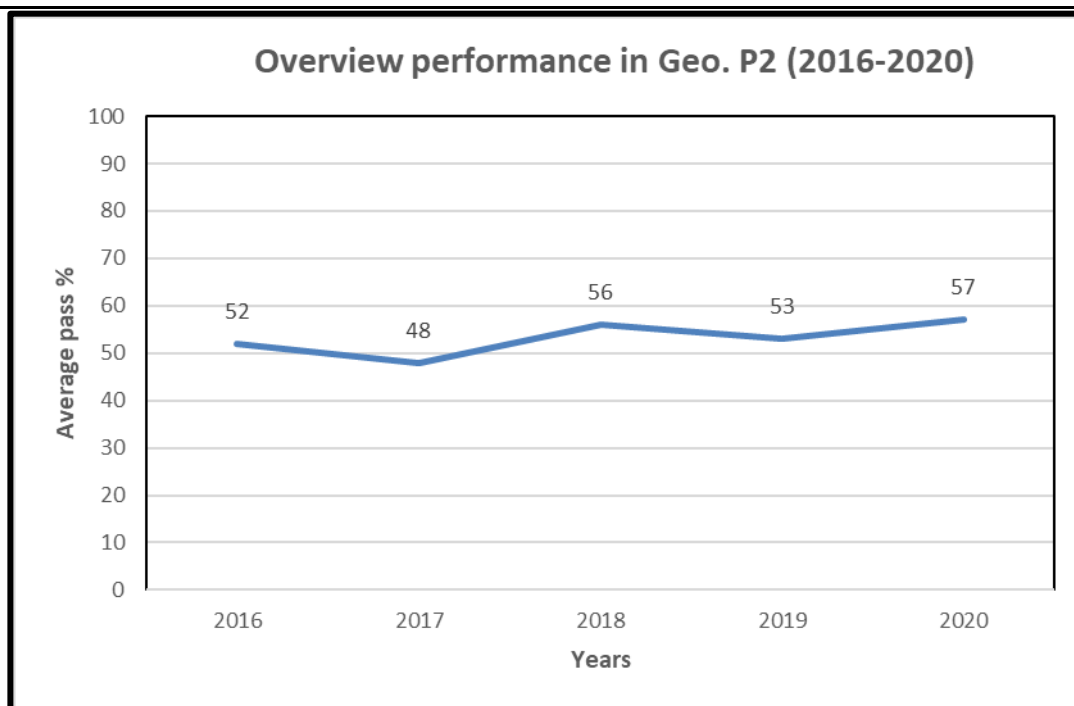
2020 NSC CHIEF MARKER'S REPORT

SUBJECT:	GEOGRAPHY
PAPER:	P2
DURATION OF PAPER:	1½ hours

SECTION 1: (General overview of Learner Performance in the question paper as a whole)

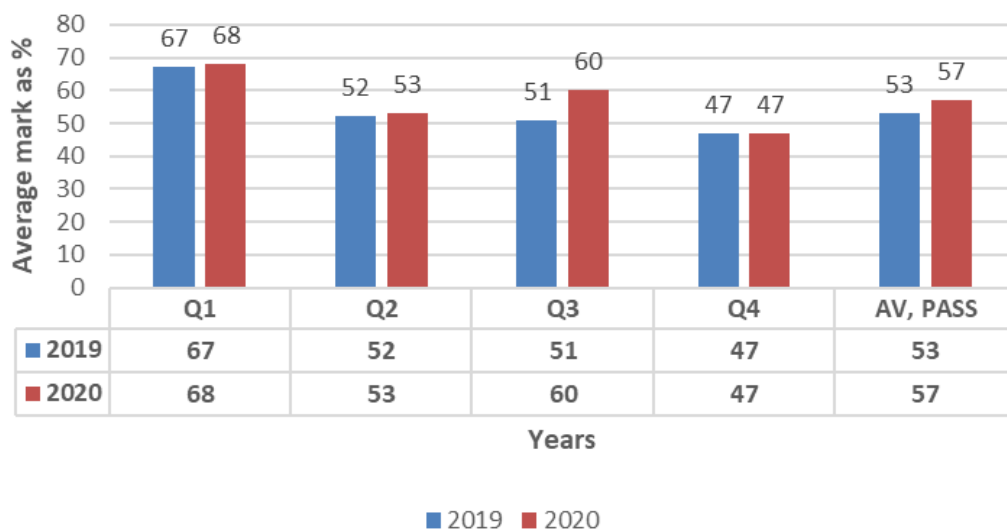
- The 2020 NSC geography question paper 2 in general, was set within the capabilities of the grade 12 geography candidates. It is pleasing to mention that the general learner performance improved from 53% (2019) to 57% (2020).
- In other words, an increase of 4% was recorded.
- The graphs (Figures 1.1.1 and 1.1.2) below show the general learner performance in Geography Paper 2 for the past five (5) years.
- It is important to mention that the scores referred to have been based on the RASCH analysis of the 100 scripts selected randomly from the 12 education districts across the entire Eastern Cape Province. The randomly sampled scripts were selected to cover low (20%), medium (60%) and high (20%). The individual scripts were then scrutinised to provide an in-depth understanding of the range of different responses, mainly focusing on the weaknesses and misconceptions of learners regarding particular areas in the subject.
- The report also incorporated findings that markers, senior markers and deputy chief markers came across during the marking process.
- It is strongly believed that the outputs of this report will be used by all stake holders in the Eastern Cape Province to come up with targeted interventions to improve and strengthen Geography as a subject and in particular Geography Paper 2.

The Overview performance trends for the past 5 years are illustrated in the graph below showing the trend of how the general performance in Geography Paper 2 has been for the past five years.



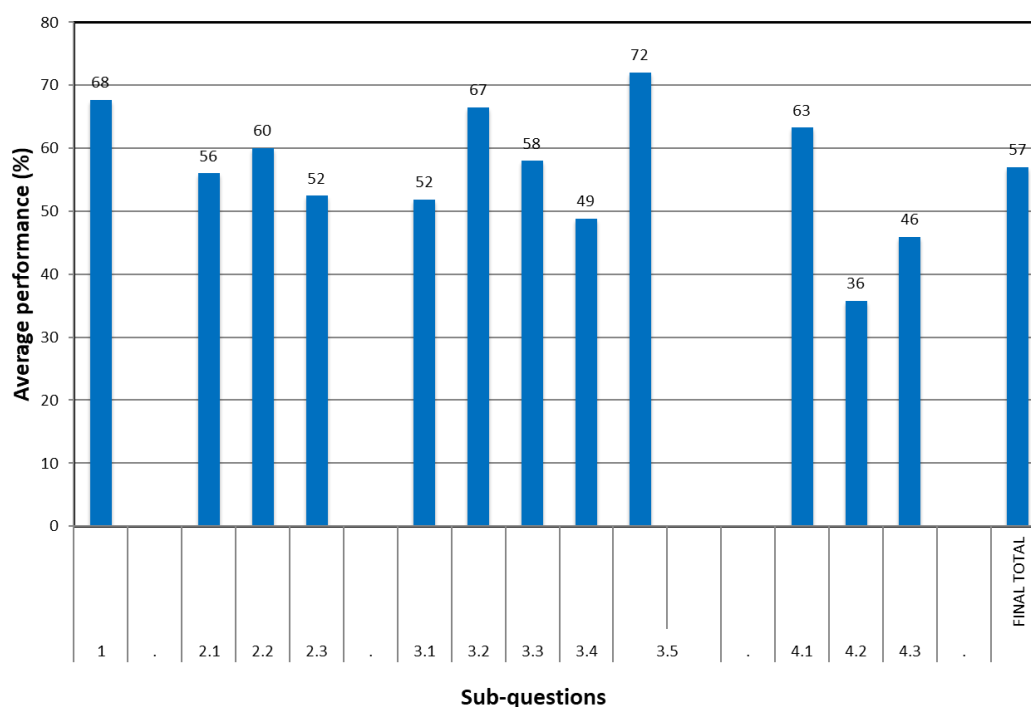
- The above graph indicates how learners have been performing from 2016 - 2020.
- The above graph shows that overall performance in Geography Paper 2 has been fluctuating from year to year. It is noted that improvements have been gained in general performance over the previous year. This pattern can also be seen in performance of individual questions.
- The graph below is an overview of performance in Geography Paper 2 over the past two years (2019 – 2020) – Q1 1%, Q2 1%, Q3 9% and Q4 0% respectively.
- The further graphs illustrate improvements gained in each of the sub-questions and individual sub-sections in 2020.
- It is pleasing to see this increase with the 2020 academic year having been a challenging one.
- Language proficiency remains a big challenge for most candidates. This affected the ability of candidates to read instructions, interpret questions and consequently provide appropriate answers to the questions.
- Once again middle and high order questions posed a major challenge to most candidates, in that learners do not write full sentences. Action words like explain and determine seem to confuse candidates. In questions where the above-mentioned verbs were used, candidates performed very poorly. Simply put, they lacked the skill on how to approach examination questions. For example, Q2.1.2, Q3.1.2, 3.1.3, Q3.5.2 and 4.3.3 (b).

Overview Performance in Geo,P2 (2019 - 2020)

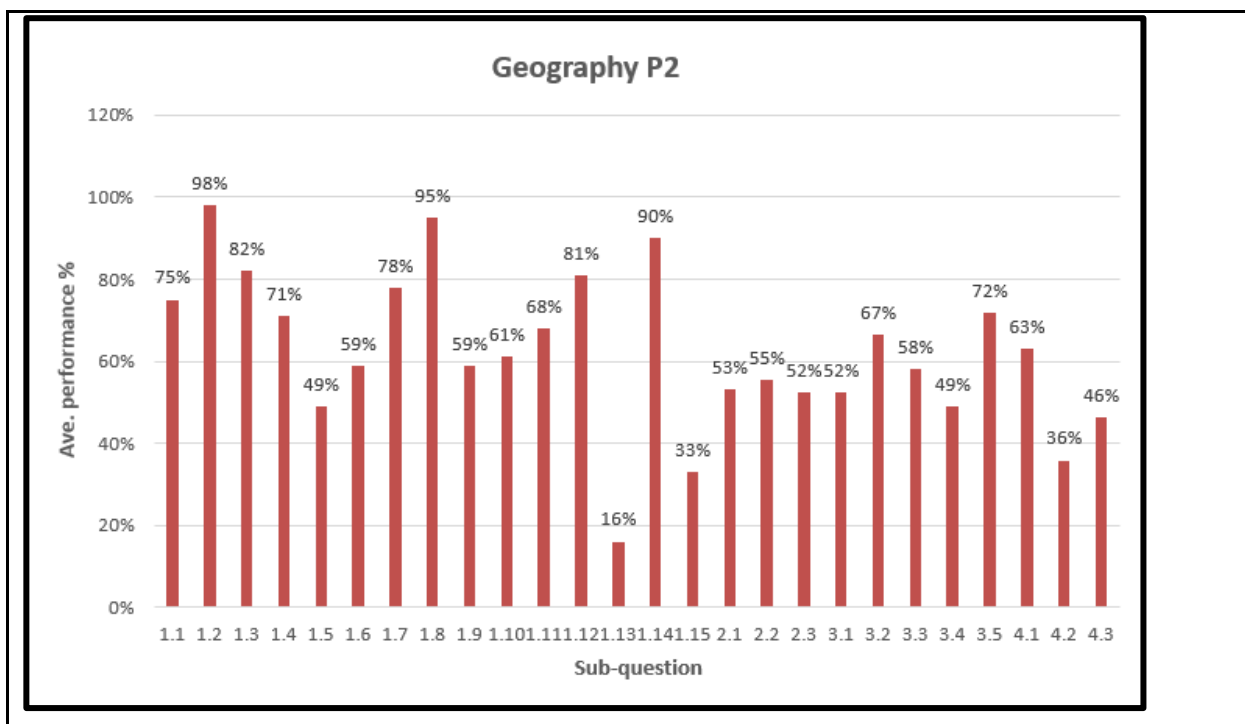


The graph below further illustrates improvements gained in each of the sub-questions in 2020.

Average Performance per sub-question in Geography - Paper 2



2020.



SECTION 2:

Comment on candidates' performance in individual questions

(It is expected that a comment will be provided for each question on a separate sheet).

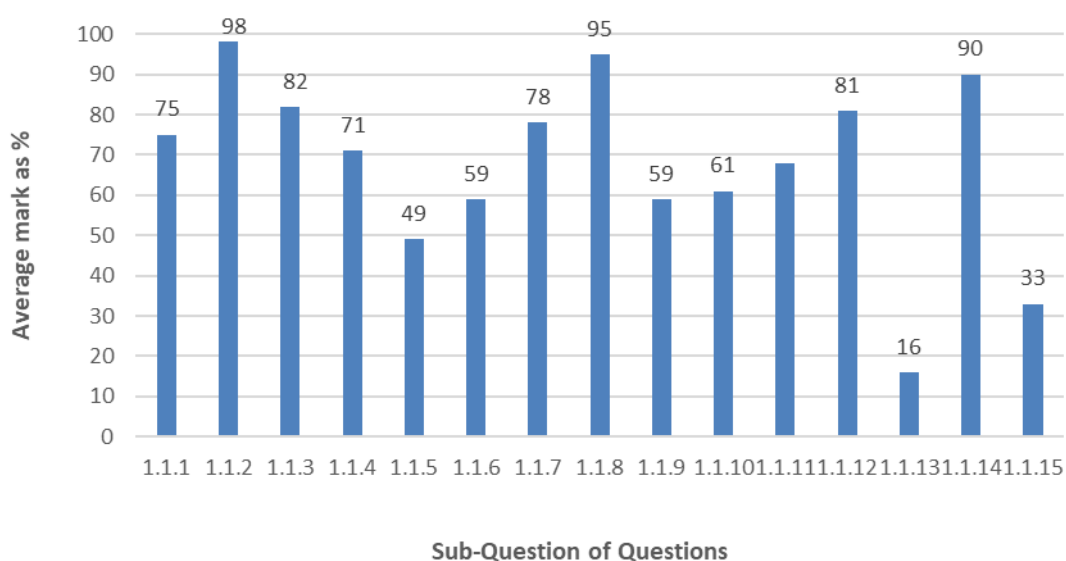
QUESTION 1: MULTIPLE CHOICE [15]

(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

- This question consists of 15 multiple choice questions and requires candidates to choose the correct answer from the list of responses given. The questions are drawn from the entire Annual Teaching Plan (ATP) for Grade 12 as articulated in the CAPS Policy document. That is, the theory (paper 1) and Map work (paper 2) content. It is therefore expected that Geography teachers integrate theory as their teaching of Geography Map work.
- The fact that Question 1 is purely multiple choice leads one to expect that learners would find it easy and therefore score high marks.

The graph below shows how learners performed in the various subquestions of Question 1. The depicted performance is based on the RASCH analysis of 100 scripts drawn randomly from the 12 Education districts of the Eastern Cape Province.

Overview Performance in Geo. P2 (Dec 2020)



- Learners performed favourably well in this question as many of the questions were low order. The average pass % increased from 67% (2019) to 68% (2020). In other words, a marginal increase of 1% was recorded.
- Even though there is a remarkable improvement in Question 1 as a whole, there are subquestions in which learners performed below 50%. The questions were:
 - 1.5 (Approximate distance along railway line) (49%)
 - 1.13 (Main activity within Protected Nature Reserve ... is part of the ... sector) (16%)
 - 1.15 (Vertical aerial photograph was produced between what time) (33%)

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

The learners performed poorly in question (Q1.5) as the candidates could not measure and convert using the scale.

- Q1.13. the candidates could not associate the sector with the Protected area. This is a clear indication of possible content gap with the learners in the economic section of the syllabus.
- Q1.15. the candidates answered the question with D as the shadows were confusing, as there were some lying to the SW. Needs to be more specific in future when the orthophoto map has features lying at different heights and angles. Candidates find it contradictory to identify on map the way in which shadows fall in different on the same map.

(c) Provide suggestions for improvement in relation to Teaching and Learning.

- Emphasis must be on the importance of reading the General (background) information page. This sets a “scene “of the mapped area. There are questions based on this.
- Basic map reading skills are essential. Read and understand the information on the map margins. 20% or more questions can be answered here.
- Ensure that learners master the legend/reference. New symbols and their meaning have been included on new maps. Be up-to-date. Refer to Pongola map (2019 November). Interesting to note candidates in Q 4.3.3 (a) could not even draw a wind- pump making use of topographic map. Learners need to understand the function of the symbol.
- Teachers must integrate map work components when teaching theory.
- Map work should be taught regularly. At least dedicate one period per week for map work.
- Basic map work skills in 8 and 9 mostly taught by History teachers and sometimes not at all. Suggestion is that qualified teachers should be teaching Geography.

(d) Describe any other specific observations relating to responses of learners and comments that are useful to teachers, subject advisors, teacher development etc.

- This is a multiple-choice question in which learner responses are pre-determined. But it is important to note that some learners rushed through the alternative answers without giving a thought. Otherwise, a straight forward question.
- Map work is skills based. Teachers to use topographic and orthophoto maps on regular basis. Reinforce this by regular map work tasks at least once week.
- Regular map work workshops should be organised for Social Science and grade 10 Geography teachers. The main objective is to develop map skills at an early stage.
- Subject advisors to develop map work sheets that lay emphasis on general Geographical skills and Techniques.
- Provincial planners to organize and develop common lesson plans focusing on problematic areas in map work. These will assist especially new teachers on how to teach map work.

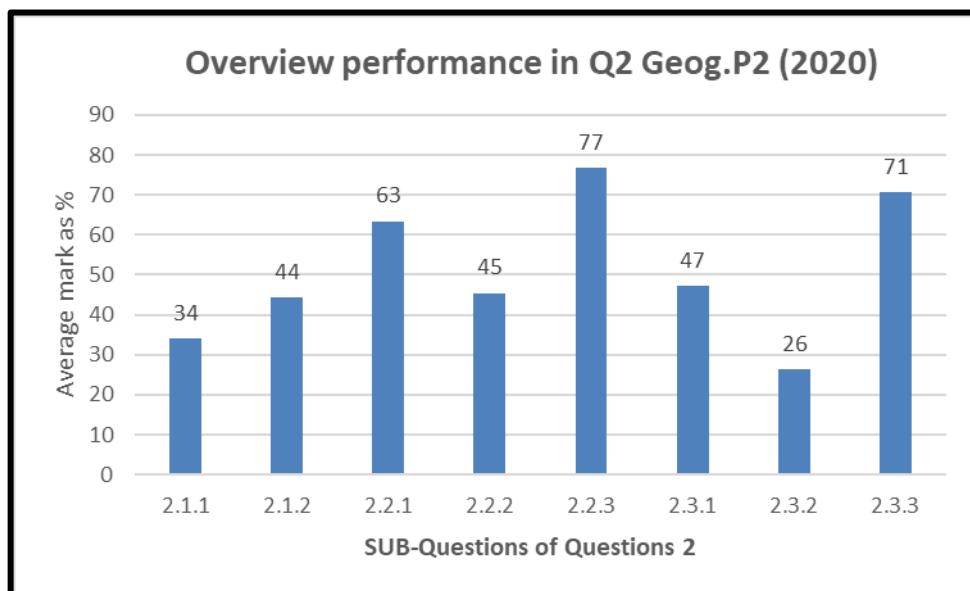
QUESTION 2: MAP CALCULATIONS AND TECHNIQUES [20]

(a) General comment on the performance of candidates in the specific question. Was the question well answered or poorly answered?

- This question consists of 20 marks of the 75 marks of Geography Paper 2.
- The general performance in this question was satisfactory when compared to the previous year (2019).
- The overall average mark percentage slightly improved from 52% (2019) and 53% (2020). There is a 1% increase for the 2020 Geography Paper 2.
- It should be noted that question 2 still poses a challenge. Most learners performed poorly in questions 2.1.2, 2.1.2, 2.2.2, 2.3.1 and 2.3.2. In all these questions learners got far below 50%.

The graph below illustrates how learners performed in each of the sub-questions of Question 2 in 2020.

The graph below illustrates how learners performed in each of the sub-questions of Question 2 in 2020.



It is evident from the graph that most learners struggled to get good marks in most of the questions. These included the following questions: Q2.1.1, Q2.1.2, Q2.2.2, Q2.3.1, and Q2.3.2(b). Candidates here obtained less than 50%.

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

- Generally, this question requires candidates to have basic mathematical skills and common errors were due to the lack of basic mathematical skills.
- Learners could not measure a true bearing accurately within 1° variance using a protractor in Q2.1.1. (34%) asked the candidates to calculate the magnetic bearing with the updated the mean magnetic declination – many learners gave an incorrect answer by putting W of TN as a unit. Answer was $333^\circ \checkmark + 17^\circ 40' = 350^\circ 40' \checkmark$ Unfair as small range penalized the learners for the final answer.
- Q2.2.2 (45%) was a good new way of asking to explain gradient using diagram, however, once again, language played a huge factor here as learners did not understand the instructional word “values”. Possibly the word ‘values’ should not have been used.
- Q2.3.1 (47%) Many learners were confused here with the vertical scale been incorrect which did affect their answers and many learners lost marks here,
- Q2.3.2 (26%) This was the worst performed sub-question. Candidates could not give a reason for the intervisibility. Learners need to be able to identify shape of contour lines to determine intervisibility i.e. is it concaved or convex, therefor obscuring sight. Also, a number of candidates in THE vertical exaggeration Q.3.3.3, referred to the vertical scale in Q2,3,1 sketch, which contained a different scale to the question in Q2.3.3.
- Although the two calculations in Q2.2.1 and Q2.3.3 were answered fairly well, however, a good number of learners had steps muddled up. They do not know when to divide or multiply/many had more zeros than required e.g. $1 : 20000$ /others omitted some steps especially that of application. The substitute and then given answer/many did not include the word ‘Times’ in the final answer/others gave the VE results in metres i.e. 25m.
- Teachers need to use verbs that are frequently used in examinations when designing informal and formal tasks. This gives learners the opportunity to practice.
- Expose learners to past exam papers so that they are used to the way examiners ask questions. This will sharpen their reasoning and critical thinking skills.

(c) Provide suggestions for improvement in relation to Teaching and Learning.

- Teachers to cover all grade 10–12 map work content. Grade 10 and 11 content acts as the foundation for grade 12.
- Teachers must go back to basics. They must order and buy metre rulers, protractors magnifying glasses and chalk board dividers.
- Teachers must demonstrate to learners on how to come up with correct or accurate measurements using the above-mentioned instruments. Map work skills are acquired through observations and practice.
- Regular practical tasks and assignments, focusing on sharpening all skills relevant to map work be given to learners. These required skills should include, measuring, conversion of map distances to reality.
- Although candidates scored well in the calculations that dealt with gradient (Q2.2.1) and vertical exaggeration (Q2.3.3), far too many learners did not follow the steps for mark allocation. Simple ‘substitution’ needs to be done and then the ‘application’.
- Learners changed (swopped)

For example:

i.e. VS : HS

SUBSTITUTE

VS – 1cm : 20m

100 x 20m = 2000cm – VS = 1 : 2000 ✓

HS = 1 : 50 000 ✓

APPLICATION

= $1/2000 \times 50\,000/1$ or $50\,000/2000$ ✓

= 25/1

= 25 times ✓

1 : 20 / 1:500

$1/20 \times 500/1$

25/1

25 times ✓

(d) Describe any other specific observations relating to responses of learners and comments that are useful to teachers, subject advisors, teacher development etc

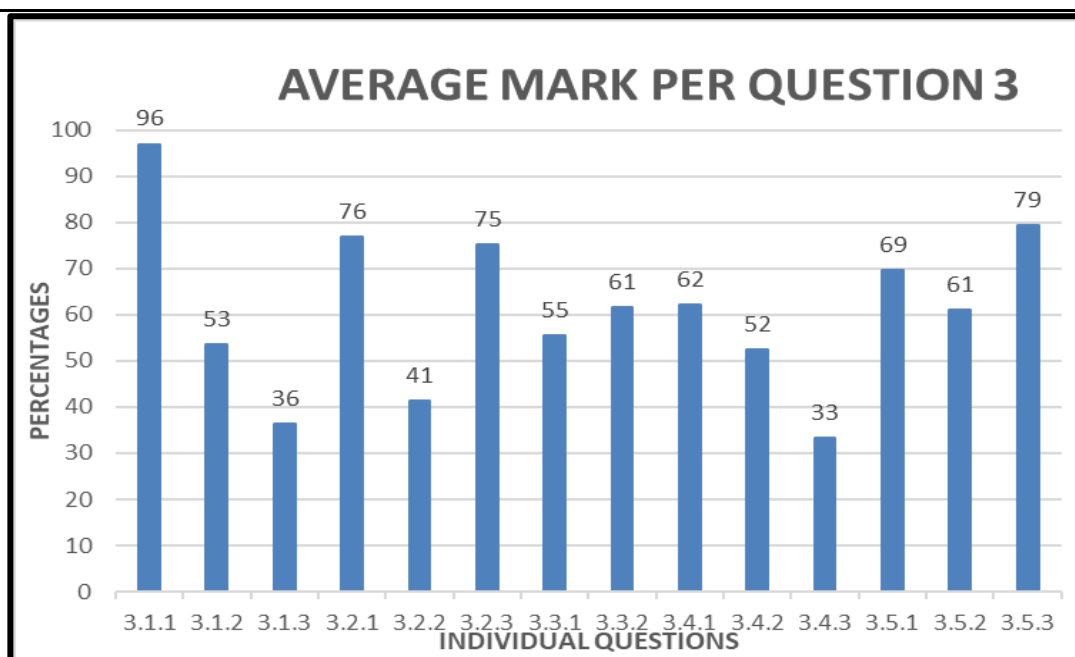
- Most candidates’ basic mathematical skills are lacking.
- They hardly consult topographic and orthophoto maps when responding to questions
- Some learners worked out Vertical Exaggeration instead of Gradient. This is an indication that they were never taught or were taught in the last minutes.
- When dealing with map calculations and techniques, emphasis should not be on obtaining the correct answer only, but also the application thereof.
- Align map work lessons with the prescripts outlined in the Geography 2017 Examinations Guidelines (p16 & 17).
- Subject Advisors/Teacher Development Institutes to conduct workshops and embark on lesson demonstrations. This will foster map work skills, especially to the newly employed teachers. PRACTISE and PRACTISE is key.

QUESTION 3: APPLICATION AND INTERPRETATION [25]

(a) General comment on the performance of candidates in the specific question. Was the question well answered or poorly answered?

- This question consists of 25 marks of the 75 marks of Geography Paper 2.
- The overall performance in this question based on the RASCH analysis improved from 51% (2019) to 60% (2020) Geography Paper 2. An upward movement of 9% was recorded.

The graph below illustrates how learners performed in the sub-questions of Question 3 in 2020.



(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed in this question by learners and any misconceptions.

- Even though there was an improvement in learner performance in this question, learners still had challenges in most of the subquestions.
- Learners were unable to answer higher order questions. This can be attributed to lack of language proficiency. As the consequence, they misinterpreted the question or completely failed to understand the questions and in process lost valuable marks. Q3.1.2, 3.1.3, 3.2.2 and 3.4.3 could be given as examples
- Most learners lacked basic Geographical knowledge and application of concepts. They could not explain the difference in temperature between P and Q and only made reference to one place (Q3.1.2).
- Q.3.1.3 confused most in the way the question was asked – learners found question ‘hanging’ and unsure of question been asked. However, the memo did allow for various answers. Many candidates did not ‘identify’ first before ‘explaining’ one strategy, therefore lost three marks in the process - only 36% of the sampled candidates (100) answered this question correctly.
- Learners have no clue of the underlying rock structure (Q3.1.3) and associated various examples of rock types as the answer.
- In Q3.4.3 (33%). Many candidates performed poorly in this subquestion. They could not reconcile map work with theory. They did not understand how the development of the street pattern related to the topographic area given.
- In Q3.5.3 candidates performed satisfactory in this question. Learners often used tax collection, increased standard of living, increase in business turnover e.g. hawkers as their answer. They were not rewarded for these economic ideas.

(c) Provide suggestions for improvement in relation to Teaching and Learning.

Two areas teachers need to focus on in this section are that:

- Learners lacked topographic interpretation skills. In almost all the questions based on the topographic map challenged learners.
- Learners were unable to respond to higher order questions. This can be attributed to lack of command of English language and consequently failed to understand the gist of the question or interpreted questions wrongly. Key words in the examiners' questions need to be broken down to see what has been asked – for example, What? (identification), Where? (location) and Why? (reasons). These must be applied on both topographic and orthophoto maps.

Also, teachers need to implement the following:

- Integration of theory and map work as an on-going basis to their teaching. This will enhance learners' understanding that theory and practical papers are interlinked.
- Thorough teaching is required. Cover all prescribed content, especially Geomorphology (last part of term and Urban settlement). These sub-topics come towards the end of first and second terms respectively. Often teachers rush through them before writing March and June Tests.
- Use topographic and orthophoto maps when dealing with theory (Paper 1 content).
- Intensive revision is required before any controlled tests and examinations.
- Schools to effectively utilise Telematics videos and presentations.

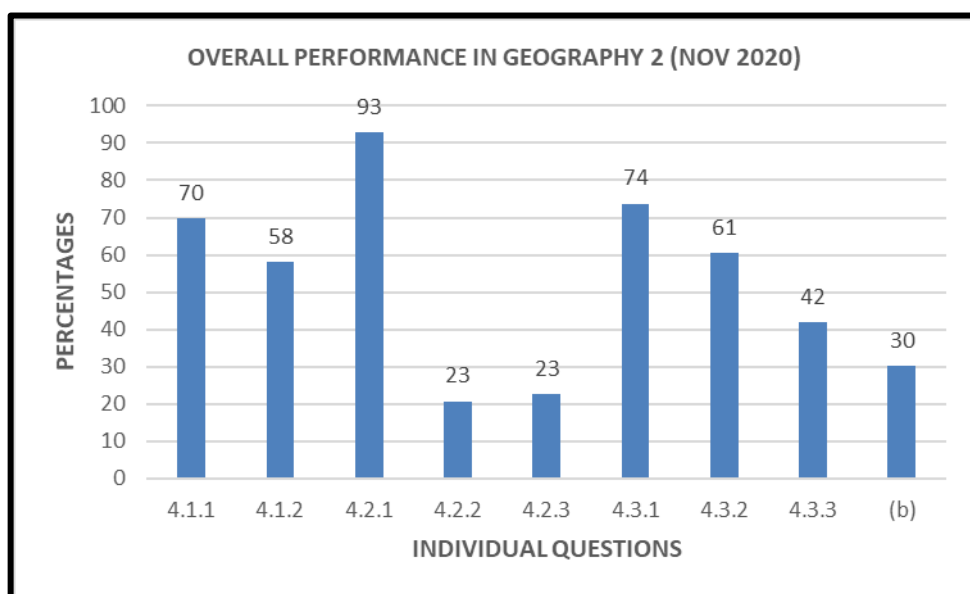
(d) Describe any other specific observations relating to responses of learners and comments that are useful to teachers, subject advisors, teacher development etc.

QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEMS. [15]

(a) General comment on the performance of candidates in the specific question. Was the question well answered or poorly answered?

- This question consists of 15 marks of the 75 marks of Geography Paper 2.
- The overall performance remained at 47 % (2019) [55% 2018] and 47% (2020). This question however still remains a section that the learners struggle to grasp.

The graph below shows the performance of learners per subquestion in the 2020 Geography Paper 2.



The worst performed sub-questions were Q4.1.2, 4.2.2 , 4.3.2 and 4.3.3.

- Learners' performance in the question was disappointing and definitely attributed to the learning year. Although the overall mark was constant with the previous year it must be noted that there has been a downward movement by 8% since 2018.
- Learners have mastered GIS concepts but lack the ability to apply these concepts to deal with real life situations. Questions 4.2 (data layers) and Q4.3 (application of concept) are classic examples.

<p>(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed in this question by learners and any misconceptions.</p>
<ul style="list-style-type: none"> • Most learners did not have a deep understanding of GIS concepts and as such lost valuable marks. The following sub-sections are classic examples Q4.2.2, Q4.2.3, Q4.3.3 (a) and (b). • Q4.2.2 & 4.2.3. Learners struggled to identifying the layers by name and instead identified 'spacial data' like rivers, contour lines... etc., but should have stated infrastructure, relief, drainage, land-use soil and vegetation. As the result shows, this was the worst performed question with Q.4.2.2 (20,7%) and 4.2.3 (22,7%). Most learners' understanding of data layers meant that they could not answer it by identifying the layers by name, on the topographic map, therefore Q4.2.3 was linked and learners lost marks here. • Q4.3.3 (a) Learners did not know the 'point feature' used to extract 'ground water' as been a wind pump. therefore, could not draw the symbol. Q4.3.3 (b) most learners did not understand the question was asking for advantages of the point feature (wind pump) location. Most learners referred too using the river for irrigation and that the cultivated land is flat. Candidates need to refer to the location in the area which has nothing there – wind pump will help extend the cultivated lands. • Otherwise, most learners had lacked basic knowledge/content concerning GIS.
<p>(c) Provide suggestions for improvement in relation to Teaching and Learning.</p>
<ul style="list-style-type: none"> • Memorising and understanding of basic GIS concepts. • Teachers should ensure that basic concepts are not only memorised but fully understood by learners. Grade 12 GIS concepts are all linked to the application and problem-solving skills. For this reason, scenarios are created to examine how well the concepts have been mastered using GIS as a tool. (<i>"tool box definition"</i>). • Provincial planners and subject advisors need to produce/ develop grade 10 - 12 booklets on GIS concepts as well as application of these concepts in real life situation. Viz their definitions, uses, advantages and disadvantages. Further, work sheets with activities need to be included. These could be done based on the Annual Teaching Plans for grade 10-12.
<p>(d) Describe any other specific observations relating to responses of learners and comments that are useful to teachers, subject advisors, teacher development etc.</p>
<ul style="list-style-type: none"> • Learners displayed lack of deep understanding of GIS and its application as a whole. • Content gap workshops for teachers, especially the newly employed. • Intensive use of telematic videos. • YouTube downloads but be selective on the sources. • Regular class activities are key.



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE/ NATIONAL SENIOR CERTIFICATE

GRADE 12

GEOGRAPHY P2

NOVEMBER 2020

MARKS: 75

TIME: 1½ hours

EXAMINATION NUMBER:															
CENTRE NUMBER:															

	M	In	SM	In	DM	In	CM	In	IM	In	MC	EA	EX	RM	In
Q1															
Q2															
Q3															
Q4															
TOT															

**This question paper consists of 15 pages and
1 page for rough work and calculations.**



★ G E O G E 2 ★



RESOURCE MATERIAL

1. An extract from the topographic map 2527CA RUSTENBURG (WEST)
2. Orthophoto map 2527 CA 15 TLHABANE
3. **NOTE:** The resource material must be collected by schools for their own use.

INSTRUCTIONS AND INFORMATION

1. Write your EXAMINATION NUMBER and CENTRE NUMBER 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 topographic map 2527CA RUSTENBURG (WEST) and an orthophoto map 2527 CA 15 TLHABANE of a part of the mapped area.
4. You must hand the topographic map and the orthophoto map to the invigilator at the end of this examination session.
5. You may use the blank page at the end 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 or compass direction in the final answer of calculations, e.g. 10 km; 2,1 cm; west of true north.
8. You may use a non-programmable calculator.
9. You may make use of a magnifying glass.
10. The area demarcated in RED/BLACK on the topographic map represents the area covered by the orthophoto map.
11. The following English terms and their Afrikaans translations are shown on the topographic map:

ENGLISH

Diggings
River
Cemetery
Protected Natural Environment
Technical College

AFRIKAANS

Uitgrawings
Rivier
Begraafplaas
Beskermde Natuurlike Omgewing
Tegniese Kollege



GENERAL INFORMATION ON RUSTENBURG

Rustenburg was established in 1851 as a central place town to support a fertile farming area producing citrus fruit, tobacco, peanuts, sunflower seeds, maize, wheat and cattle. The area became a primary agricultural region with vast citrus estates due to the favourable climate.

Rustenburg is home to the two largest platinum mines in the world and the world's largest platinum refinery, which processes around 70% of the world's platinum.

Lately, the vast citrus estates in the region have been in constant decline due to pollution from increased smelting and beneficiating processes by the mines. (Beneficiation is when value is added to the raw materials.)

Rustenburg has a temperate climate. It has very warm summers and mild winters. Due to the altitude, summers are not quite as hot as one might expect. Precipitation occurs mainly in summer.



[Source: <http://en.wikipedia.org/wiki/rustenburg>]



QUESTION 1: MULTIPLE-CHOICE QUESTIONS

The questions below are based on the 1 : 50 000 topographic map 2527CA RUSTENBURG (WEST) as well as the orthophoto map 2527 CA 15 TLHABANE. 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 Rustenburg is situated in ...

- A Gauteng.
- B Limpopo.
- C the North West.
- D the Free State.

1.2 The contour interval on the orthophoto map is ... metres.

- A 5
- B 10
- C 20
- D 25

1.3 The map index of the topographic map, south-west of 2527CA RUSTENBURG, is ...

- A 2527CC.
- B 2526DD.
- C 2527AC.
- D 2526BD.

1.4 The grid reference/coordinates of trigonometrical station 256 in block **C1** on the topographic map is ...

- A 25°34'35"S 27°05'19"E.
- B 27°05'35"S 25°34'19"E.
- C 27°05'34"S 25°35'19"E.
- D 25°34'23"S 27°05'33"E.

1.5 The approximate distance from **K** in block **H10** on the topographic map along the railway to Rustenburg in a south-easterly direction is ... km.

- A 1
- B 1,5
- C 2
- D 2,5

1.6 Stream **L** in block **B2** on the topographic map flows in a ... direction.

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



1.7 The climate of Rustenburg is mainly influenced by ...

- A altitude.
- B fronts.
- C the ocean.
- D aspect.

☐

1.8 At night the ... wind influences the temperatures of Geelhoutpark (**H8**) on the topographic map.

- A anabatic
- B katabatic
- C onshore
- D offshore

☐

1.9 The N4 passes through a ... in the Magaliesberg mountain range.

- A ridge
- B valley
- C gorge
- D gap

☐

1.10 Land-use zone **1** on the orthophoto map is the ... zone.

- A transition
- B commercial
- C residential
- D industrial

☐

1.11 The physical expansion of Rustenburg in a westerly direction is mostly limited by the ...

- A cultivated lands.
- B national road.
- C mountain range.
- D water features.

☐

1.12 Rustenburg was originally classified as a ... town.

- A central place
- B specialised
- C break-of-bulk
- D trade and transport

☐

1.13 The main activity within the Magaliesberg Protected Natural Environment on the topographic map is part of the ... sector.

- A primary
- B secondary
- C tertiary
- D quaternary

☐

1.14 The feature at **2** on the orthophoto map is a/an ...

- A industry.
- B mall.
- C school.
- D station.

☐

1.15 The vertical aerial photograph from which the orthophoto map was produced was taken between ...

- A 06:00 and 07:00.
- B 10:00 and 11:00.
- C 14:00 and 15:00.
- D 18:00 and 19:00.

☐

(15 x 1)

[15]



QUESTION 2: MAP CALCULATIONS AND TECHNIQUES

2.1 Refer to the hiking trail in blocks **A5** and **B5** on the topographic map.

- 2.1.1 Determine the 2020 magnetic bearing (MB) of the hiking trail from **M** to **N** in blocks **A5** and **B5** if the updated mean magnetic declination (MD) is 17°40' west of true north. Show ALL calculations. Marks will be awarded for calculations.

Formula:

Magnetic bearing = true bearing + magnetic declination

(2 x 1) (2)

- 2.1.2 Explain why it is important to use the magnetic bearing instead of the true bearing to determine direction on topographic maps.

(1 x 1) (1)

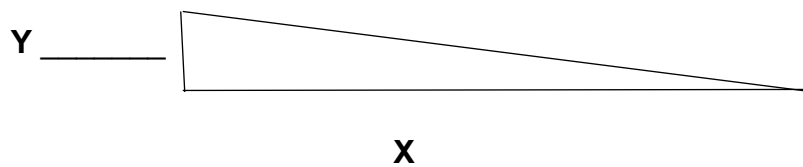
2.2 Refer to the orthophoto map and answer the questions on gradient.

- 2.2.1 Determine the average gradient of the slope for a truck that will transport its cargo (goods) from the industries at **3** (1 160 m above sea level) to the railway station at **4** (1 148 m above sea level) on the orthophoto map. Show ALL calculations. Marks will be awarded for calculations.

Formula: **Average gradient** = $\frac{\text{vertical interval (VI)}}{\text{horizontal equivalent (HE)}}$

(5 x 1) (5)

- 2.2.2 Fill in the correct values for **X** and **Y** in the space on the diagram below with regard to the answer to QUESTION 2.2.1.



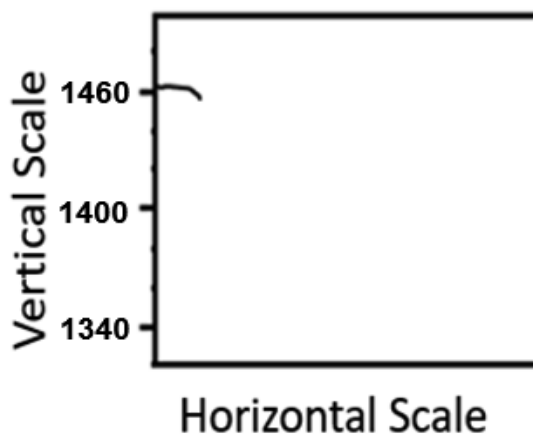
(2 x 1) (2)

- 2.2.3 Why will it be easy for the truck to transport its cargo over the calculated gradient?

(1 x 1) (1)

- 2.3 Refer to the line drawn from spot height 1461 in block **C1** to the ruin at **O** in block **C2** on the topographic map.

- 2.3.1 Complete the rough cross-section below from spot height 1461 in block **C1** to the ruin at **O** in block **C2**.



(3 x 1) (3)

- 2.3.2 Is the ruin at **O** in block **C2** intervisible from spot height 1461 in block **C1**? Answer YES or NO. Give a reason for your answer.

Yes OR No: _____

Reason: _____

(1 + 1) (2)

- 2.3.3 Calculate the vertical exaggeration (VE) of the cross-section between spot height 1461 in block **C1** and the ruin at **O** in block **C2** if the vertical scale is 1 cm represents 20 m.

Show ALL calculations. Marks will be awarded for calculations.

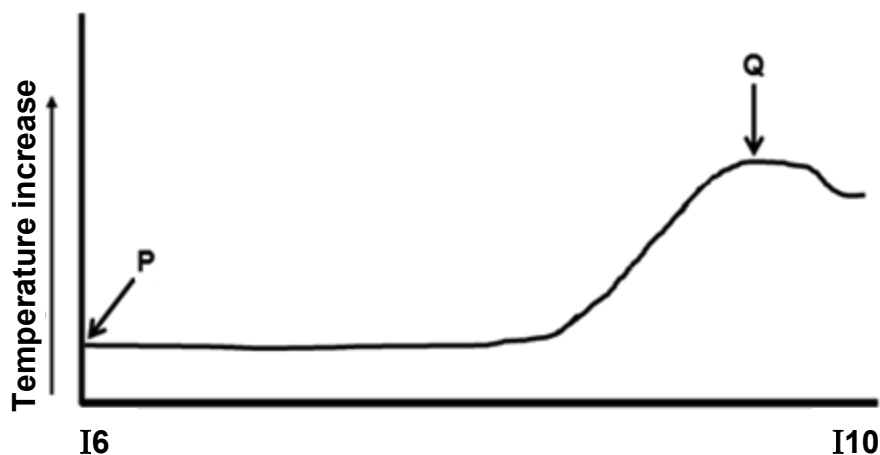
Formula: **Vertical exaggeration** = $\frac{\text{vertical scale (VS)}}{\text{horizontal scale (HS)}}$

(4 x 1)

(4)
[20]

QUESTION 3: APPLICATION AND INTERPRETATION

- 3.1 The temperature graph below illustrates the general temperature change during the day from spot height 1614 (**P**) in block **I6** to the technical college (**Q**) in block **I10** on the topographic map.



- 3.1.1 The general trend of the change in temperature from **P** to **Q** is (increasing/decreasing)

_____ (1 x 1) (1)

- 3.1.2 Give a reason from the topographic map to explain the difference in temperature at **P** and **Q**.

_____ (1 x 2) (2)

- 3.1.3 Identify and explain ONE strategy that could be implemented by the local municipality in block **I10**.

Identification: _____

Explanation: _____

_____ (1 + 2) (3)

3.2 Refer to the river system in block **C7**.

3.2.1 Identify the drainage pattern of the river system in block **C7**.

_____ (1 x 1) (1)

3.2.2 State the underlying rock structure associated with the drainage pattern identified in QUESTION 3.2.1.

_____ (1 x 1) (1)

3.2.3 Determine the stream order of the river system at point **R**.

_____ (1 x 2) (2)

3.3 Refer to the stream flowing southwards in block **G4**.

3.3.1 In which stage of the fluvial cycle is the stream in block **G4**?

_____ (1 x 1) (1)

3.3.2 Give ONE piece of evidence from block **G4** to support your answer to QUESTION 3.3.1.

_____ (1 x 1) (1)

3.4 Refer to blocks **C10** and **G7** on the topographic map.

3.4.1 Identify the street plans (patterns) at **S** in block **C10** and at **T** in block **G7**.

Street plan S: _____

Street plan T: _____ (2 x 1) (2)

3.4.2 State TWO advantages of street plan (pattern) **T** in block **G7**.

Street plan T: _____

_____ (2 x 1) (2)

3.4.3 Give evidence from the topographic map for the development of the street plan (pattern) at **T**.

_____ (1 x 2) (2)

3.5 Refer to the mining activities of Townlands Platinum Mines on the orthophoto map and topographic map.

3.5.1 Give ONE reason evident on the topographic map that indicates that mining at Townlands Platinum Mines is practised on a large scale.

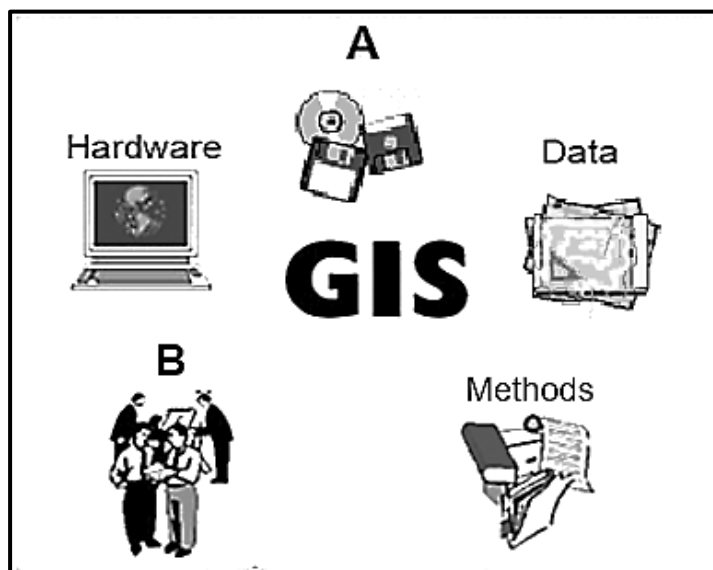
_____ (1 x 1) (1)

3.5.2 Explain how mining activities at Townlands Platinum Mines caused an environmental injustice in the area.

_____ (1 x 2) (2)

3.5.3 Discuss the positive impact that Townlands Platinum Mines has on the economic development of Rustenburg.

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

QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEMS (GIS)**4.1 COMPONENTS OF GIS**

4.1.1 Identify the components **A** and **B**.

A: _____

B: _____ (2 x 1) (2)

4.1.2 Why is component **B** important in GIS processes?

_____ (1 x 2) (2)

4.2 Two locations (blocks **F10** and **H7** on the topographic map) have been identified for the development of a new cemetery. A GIS specialist has been appointed by the local municipality to recommend the best site for this development.

4.2.1 Which of the TWO locations (block **F10** or block **H7**) will be most suitable for the development of the new cemetery?

(1 x 1) (1)

4.2.2 Identify TWO data layers that can be used in deciding on the new location for the cemetery.

_____ (2 x 1) (2)



- 4.2.3 Give a reason for your choice of ONE of the data layers identified in QUESTION 4.2.2.

(1 x 2) (2)

- 4.3 Refer to block **J1** on the topographic map.

- 4.3.1 What is *vector data*?

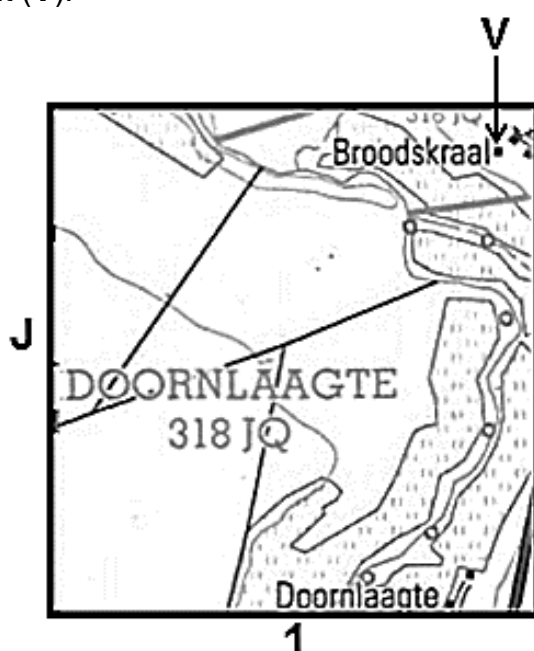
(1 x 1) (1)

- 4.3.2 Give ONE natural line feature that the farmer used to determine the site of the cultivated land in block **J1**.

(1 x 1) (1)

- 4.3.3 Agricultural activity in block **J1** on the topographic map is confined along the river.

- (a) Draw the symbol of the point feature that is used to extract ground water to increase water supply for agriculture, on the enlarged illustration of block **J1** below. This feature must be 40 mm southwest of the Broodskraal settlement (**V**).



(2 x 1) (2)



- (b) Explain the advantage of this specific location of the point feature drawn in QUESTION 4.3.3(a) for farming in the area.

(1 x 2)

(2)
[15]**TOTAL: 75**

ROUGH WORK AND CALCULATIONS

(NOTE: Do NOT detach this page from the question paper.)





basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE/ NATIONAL SENIOR CERTIFICATE

GRADE 12

GEOGRAPHY P2

UMALUSI

NOVEMBER 2020

15 DEC 2020

MARKING GUIDELINE

MARKS: 75

Name	Designation	Signature	Date
Mrs. ZPL SHABALALA	Umalusi External Moderator	<i>Zpl Shabalala</i>	15-12-2020
Mr. K NAIR	Umalusi External Moderator	<i>K Nair</i>	15-12-2020
Mr. GD SAMAAI	Umalusi External Moderator	<i>GD Samaa</i>	15/12/2020
Ms. T MAGSON	DBE Internal Moderator	<i>T Magson</i>	15/12/20
Mr. R DAVECHAND	DBE Internal Moderator	<i>R Davech</i>	15/12/2020

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DEPARTMENT OF BASIC
EDUCATION

PRIVATE BAG X835, PRETORIA 0001

2020-12-15

APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

RESOURCE MATERIAL

1. An extract from the topographic map 2527CA RUSTENBURG (WEST)
2. Orthophoto map 2527 CA 15 TLHABANE
3. **NOTE:** The resource material must be collected by schools for their own use.

INSTRUCTIONS AND INFORMATION

1. Write your EXAMINATION NUMBER and CENTRE NUMBER 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 topographic map 2527CA RUSTENBURG (WEST) and an orthophoto map 2527 CA 15 TLHABANE of a part of the mapped area.
4. You must hand the topographic map and the orthophoto map to the invigilator at the end of this examination session.
5. You may use the blank page at the end 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 or compass direction in the final answer of calculations, e.g. 10 km; 2,1 cm; west of true north.
8. You may use a non-programmable calculator.
9. You may make use of a magnifying glass.
10. The area demarcated in RED/BLACK on the topographic map represents the area covered by the orthophoto map.
11. The following English terms and their Afrikaans translations are shown on the topographic map:

ENGLISH

Diggings
River
Cemetery
Protected Natural Environment
Technical College

AFRIKAANS

Uitgrawings
Rivier
Begraafplaas
Beskermde Natuurlike Omgewing
Tegniese Kollege



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GENERAL INFORMATION ON RUSTENBURG

Rustenburg was established in 1851 as a central place town to support a fertile farming area producing citrus fruit, tobacco, peanuts, sunflower seeds, maize, wheat and cattle. The area became a primary agricultural region with vast citrus estates due to the favourable climate.

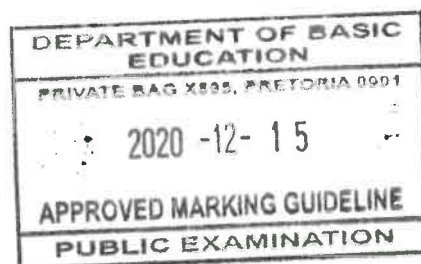
Rustenburg is home to the two largest platinum mines in the world and the world's largest platinum refinery, which processes around 70% of the world's platinum.

Lately, the vast citrus estates in the region have been in constant decline due to pollution from increased smelting and beneficiating processes by the mines. (Beneficiation is when value is added to the raw materials.)

Rustenburg has a temperate climate. It has very warm summers and mild winters. Due to the altitude, summers are not quite as hot as one might expect. Precipitation occurs mainly in summer.



[Source: <http://en.wikipedia.org/wiki/rustenburg>]



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QUESTION 1: MULTIPLE-CHOICE QUESTIONS

The questions below are based on the 1 : 50 000 topographic map 2527CA RUSTENBURG (WEST) as well as the orthophoto map 2527 CA 15 TLHABANE. 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 Rustenburg is situated in ...

- A Gauteng.
- B Limpopo.
- C the North West.
- D the Free State.

✓
C

1.2 The contour interval on the orthophoto map is ... metres.

- A 5
- B 10
- C 20
- D 25

✓
A

1.3 The map index of the topographic map, south-west of 2527CA RUSTENBURG, is ...

- A 2527CC.
- B 2526DD.
- C 2527AC.
- D 2526BD.

✓
B

1.4 The grid reference/coordinates of trigonometrical station 256 in block **C1** on the topographic map is ...

- A 25°34'35"S 27°05'19"E.
- B 27°05'35"S 25°34'19"E.
- C 27°05'34"S 25°35'19"E.
- D 25°34'23"S 27°05'33"E.

✓
D

1.5 The approximate distance from **K** in block **H10** on the topographic map along the railway to Rustenburg in a south-easterly direction is ... km.

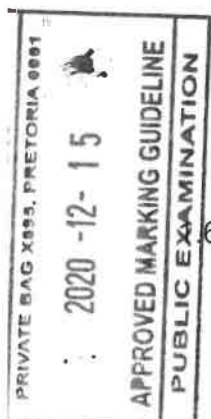
- A 1
- B 1,5
- C 2
- D 2,5

✓
B

1.6 Stream **L** in block **B2** on the topographic map flows in a ... direction.

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

✓
C



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- 1.7 The climate of Rustenburg is mainly influenced by ...
- A altitude.
B fronts.
C the ocean.
D aspect.
- 1.8 At night the ... wind influences the temperatures of Geelhoutpark (H8) on the topographic map.
- A anabatic
B katabatic
C onshore
D offshore
- 1.9 The N4 passes through a ... in the Magaliesberg mountain range.
- A ridge
B valley
C gorge
D gap
- 1.10 Land-use zone 1 on the orthophoto map is the ... zone.
- A transition
B commercial
C residential
D industrial
- 1.11 The physical expansion of Rustenburg in a westerly direction is mostly limited by the ...
- A cultivated lands.
B national road.
C mountain range.
D water features.
- 1.12 Rustenburg was originally classified as a ... town.
- A central place
B specialised
C break-of-bulk
D trade and transport

✓
A✓
B✓
D✓
D✓
C✓
A

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EM3

1.13 The main activity within the Magaliesberg Protected Natural Environment on the topographic map is part of the ... sector.

- A primary
- B secondary
- C tertiary
- D quaternary

✓
C

1.14 The feature at **2** on the orthophoto map is a/an ...

- A industry.
- B mall.
- C school.
- D station.

✓
C

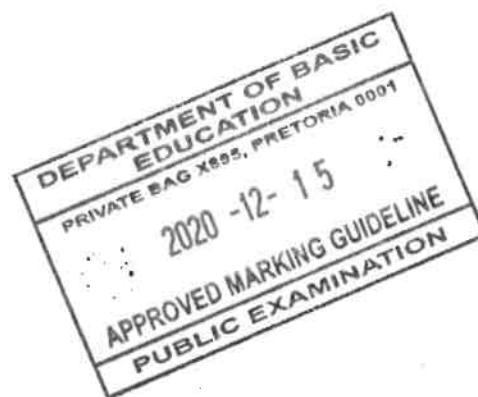
1.15 The vertical aerial photograph from which the orthophoto map was produced was taken between ...

- A 06:00 and 07:00.
- B 10:00 and 11:00.
- C 14:00 and 15:00.
- D 18:00 and 19:00.

✓
C

(15 x 1)

[15]



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EM2

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QUESTION 2: MAP CALCULATIONS AND TECHNIQUES

2.1 Refer to the hiking trail in blocks **A5** and **B5** on the topographic map.

- 2.1.1 Determine the 2020 magnetic bearing (MB) of the hiking trail from **M** to **N** in blocks **A5** and **B5**, if the updated mean magnetic declination (MD) is $17^{\circ}40'$ west of true north. Show ALL calculations. Marks will be awarded for calculations.

Formula:

Magnetic bearing = true bearing + magnetic declination

Magnetic Bearing: $333^{\circ}\checkmark (332^{\circ} - 334^{\circ}) + 17^{\circ}40' = 350^{\circ}40'\checkmark$
(range $349^{\circ}40'$ to $351^{\circ}40'$) (2 x 1) (2)

- 2.1.2 Explain why it is important to use the magnetic bearing instead of the true bearing to determine direction on topographic maps.

Desired destination will not be reached if the true bearing is used/To reach desired destination ✓

The magnetic north changes annually ✓

Magnetic bearing gives you correct/ accurate direction ✓

(ANY ONE) (1 x 1) (1)

2.2 Refer to the orthophoto map and answer the questions on gradient.

- 2.2.1 Determine the average gradient of the slope for a truck that will transport its cargo (goods) from the industries at **3** (1 160 m above sea level) to the railway station at **4** (1 148 m above sea level) on the orthophoto map. Show ALL calculations. Marks will be awarded for calculations.

Formula: **Average gradient** = $\frac{\text{vertical interval (VI)}}{\text{horizontal equivalent (HE)}}$

Vertical interval: $1\ 160 - 1\ 148 = 12\checkmark\text{m}$

Horizontal equivalent: $16,4\checkmark\text{cm} \times 100$ (range: 16,3 to 16,9)

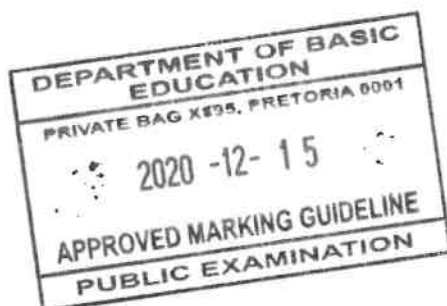
$1\ 640\checkmark\text{m}$ (range: 1 630 to 1 690)

$\frac{12}{1640}\checkmark$ (correct substitution)

$\frac{1}{136.7}$

OR

$1 : 136,7\checkmark$ (range: 1 : 135,8 to 140,8) (5 x 1) (5)



IM1
[Signature]

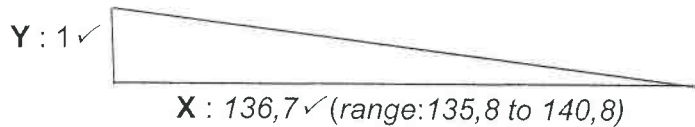
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EM3
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- 2.2.2 Fill in the correct values for **X** and **Y** in the space on the diagram below with regard to the answer to QUESTION 2.2.1.



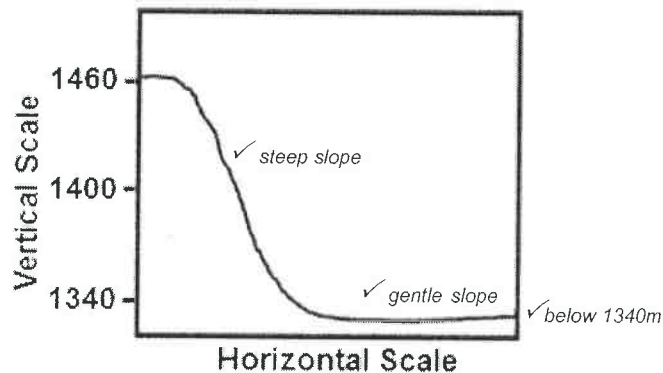
(If candidate has a different answer at **X** in Q 2.2.1 but used that answer and correctly substituted it into **X**, marks should be allocated for the conceptual understanding) (2 x 1) (2)

- 2.2.3 Why will it be easy for the truck to transport its cargo over the calculated gradient?

The slope / gradient is gentle ✓ (1 x 1) (1)

- 2.3 Refer to the line drawn from spot height 1461 in block **C1** to the ruin at **O** in block **C2** on the topographic map.

- 2.3.1 Complete the rough cross-section below from spot height 1461 in block **C1** to the ruin at **O** in block **C2**.



(3 x 1) (3)

- 2.3.2 Is the ruin at **O** in block **C2** intervisible from spot height 1461 in block **C1**? Answer YES or NO. Give a reason for your answer.

Yes OR No: *No ✓*

Reason: *The convex slope ✓* (1 + 1) (2)

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- 2.3.3 Calculate the vertical exaggeration (VE) of the cross-section between spot height 1461 in block **C1** and the ruin at **O** in block **C2** if the vertical scale is 1 cm represents 20 m.

Show ALL calculations. Marks will be awarded for calculations.

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

$$VS = 1:2000 \checkmark$$

$$HS = 1:50\,000 \checkmark$$

$$VE = \frac{1:2\,000}{1:50\,000} \checkmark$$

$$\frac{1}{2000} \times \frac{50\,000}{1}$$

$$25 \text{ times} \checkmark$$

(4 x 1)

(4)
[20]



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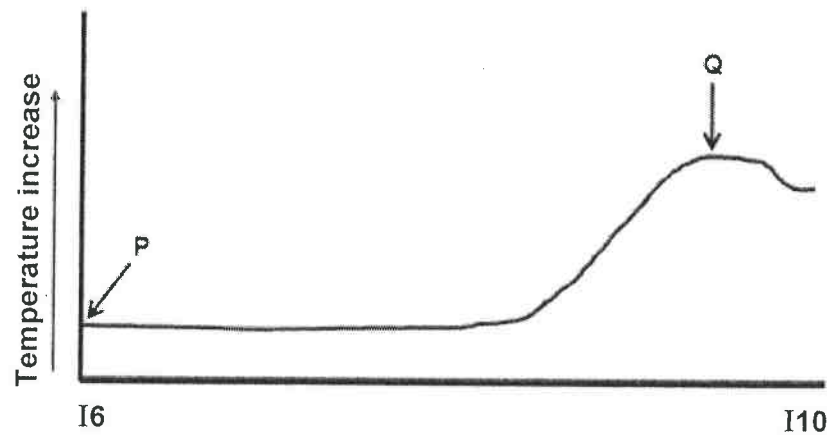
EM1

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QUESTION 3: APPLICATION AND INTERPRETATION

- 3.1 The temperature graph below illustrates the general temperature change during the day from spot height 1614 (**P**) in block **I6** to the technical college (**Q**) in block **I10** on the topographic map.



- 3.1.1 The general trend of the change in temperature from **P** to **Q** is (increasing/decreasing)

Increasing ✓

(1 x 1) (1)

- 3.1.2 Give a reason from the topographic map to explain the difference in temperature at **P** and **Q**.

*The built-up area at **Q** absorbs more heat than the natural area at **P** ✓✓*

*The natural area at **P** absorbs less heat than the built-up area at **Q** ✓✓*

*The area at **P** is at a higher altitude therefore lower temperatures are experienced ✓✓*

(ANY ONE)

(1 x 2) (2)



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IM 1

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EM 1

EM 2

EM 3

- 3.1.3 Identify and explain ONE strategy that could be implemented by the local municipality in block I10.

Identification	Explanation
Green belt/Recreational area/sports field ✓ (roof top gardens)	Plants/vegetation absorb a lot of heat for photosynthesis ✓✓ Vegetation absorb a lot of greenhouse gases/carbon dioxide ✓✓
Reflective paint colours ✓	Surface with high albedo reflects more heat so they stay cool. ✓✓
Public transportation ✓	Reduce the number of vehicles ✓✓
Water sources ✓	Water reduces temperature ✓✓
Green energy ✓	Energy saving strategies e.g. solar energy, bio mass energy ✓✓
Legislation ✓	Give laws and fines for excessive release of pollution ✓✓
[ANY ONE] (1 x 1) (1)	[ANY ONE] (1 x 2) (2)

- 3.2 Refer to the river system in block C7.

- 3.2.1 Identify the drainage pattern of the river system in block C7.

Dendritic pattern ✓ (1 x 1) (1)

- 3.2.2 State the underlying rock structure associated with the drainage pattern identified in QUESTION 3.2.1.

Uniform /homogeneous/ similar resistant rock structure ✓
[Not examples] (1 x 1) (1)

- 3.2.3 Determine the stream order of the river system at point R.

3rd ✓✓ (order) (1 x 2) (2)



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3.3 Refer to the stream flowing southwards in block **G4**.

3.3.1 In which stage of the fluvial cycle is the stream in block **G4**?

Upper course ✓

(Young/Youthful/Torrent stage)

(1 x 1) (1)

3.3.2 Give ONE piece of evidence from block **G4** to support your answer to QUESTION 3.3.1.

Contour lines point to the highest value indicating a steep sloped valley ✓

Magaliesberg/ contour lines close together/ steep slopes/ mountainous area ✓

Short non-perennial stream/1st order stream ✓

Straight stream ✓

Close to source ✓

(ANY ONE)

(1 x 1) (1)

3.4 Refer to blocks **C10** and **G7** on the topographic map.

3.4.1 Identify the street plans (patterns) at **S** in block **C10** and at **T** in block **G7**.

Street plan S: *Radial ✓*

Street plan T: *Irregular ✓*

(2 x 1) (2)

3.4.2 State TWO advantages of street plan (pattern) **T** in block **G7**.

Street plan T: *Smooth flow of traffic/ fewer intersections ✓*
Not monotonous/not boring/ interesting suburb layout ✓

It accommodates steep slopes ✓

Saves time ✓

Saves fuel ✓

Not easy to hijack ✓

Fewer accidents ✓

Less road rage ✓

Less noise/air pollution ✓

Aesthetic appeal ✓

(ANY TWO)

(2 x 1) (2)

3.4.3 Give evidence from the topographic map for the development of the street plan (pattern) at **T**.

Accommodates the steep gradient/slope ✓✓

(1 x 2) (2)



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3.5 Refer to the mining activities of Townlands Platinum Mines on the orthophoto map and topographic map.

3.5.1 Give ONE reason evident on the topographic map that indicates that mining at Townlands Platinum Mines is practised on a large scale.

Occupies a large area ✓
Service lines ✓
Mine dumps ✓
Slimes dams ✓
Power lines ✓
Conveyor belt ✓
Shafts ✓
Roads/ railway line ✓
Excavations ✓
Canals/ pipelines/ reservoirs ✓
(ANY ONE)

(1 x 1) (1)

3.5.2 Explain how mining activities at Townlands Platinum Mines caused an environmental injustice in the area.

Biodiversity is disturbed ✓✓
Decrease/removal of natural vegetation ✓✓
Increases soil erosion ✓✓
The occurrence of slimes dams ✓✓
Ecosystems are disturbed ✓✓
Aesthetic disturbance (no aesthetic beauty) ✓✓
Air/ water/ land pollution/ acid rain increases ✓✓
Noise pollution increases ✓✓
Acid mine drainage increases ✓✓
Increases land despoliation/ scarring/ land degradation/sinkholes ✓✓
(ANY ONE-MUST BE A QUALIFIED INJUSTICE)

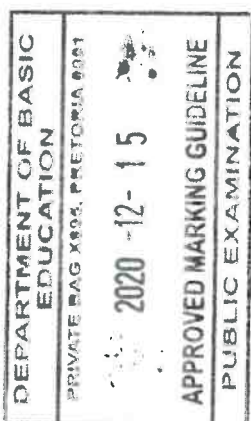
(1 x 2) (2)

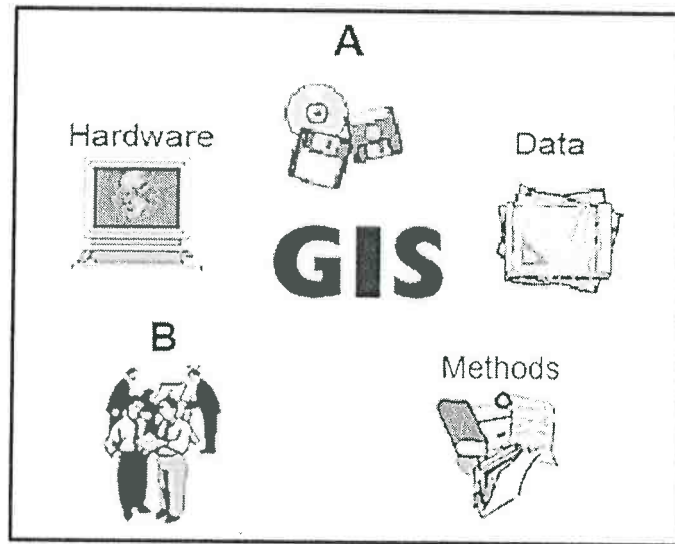
3.5.3 Discuss the positive impact that Townlands Platinum Mines has on the economic development of Rustenburg.

It provides job opportunities to the surrounding community ✓✓
It provides/develops/improves the infrastructure ✓✓ (accept example of different types of infrastructure, e.g. road, power supply, railway, etc. ✓✓)
It brings business and investment opportunities to Rustenburg town ✓✓
Multiplier effect on all sectors (accept qualified examples) ✓✓
Increased earnings stimulate trade in local market and increases buying power ✓✓
Local authorities improve service delivery ✓✓
Sector education training authorities (SETA) enable skills development to local population for employment in mines ✓✓
Increases foreign exchange may be linked to the point on investments ✓✓

(ANY TWO)

(2 x 2) (4)
[25]



QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEMS (GIS)**4.1 COMPONENTS OF GIS**

4.1.1 Identify the components **A** and **B**.

A: Software ✓

B: People ✓

(2 x 1) (2)

4.1.2 Why is component **B** important in GIS processes?

People collect/ capture/ store/ manipulate/ retrieve/ analyse/ make decisions of geographic data ✓✓

[Accept examples]

(ANY ONE)

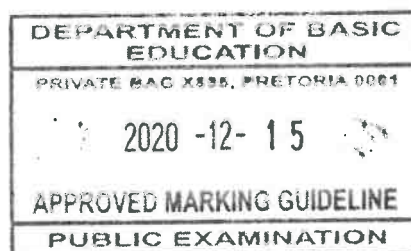
(1 x 2) (2)

4.2 Two locations (blocks **F10** and **H7** on the topographic map) have been identified for the development of a new cemetery. A GIS specialist has been appointed by the local municipality to recommend the best site for this development.

4.2.1 Which of the **TWO** locations (block **F10** or block **H7**) will be most suitable for the development of the new cemetery?

F10 ✓

(1 x 1) (1)



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- 4.2.2 Identify TWO data layers that can be used in deciding on the new location for the cemetery.

Infrastructure ✓
Relief/topography ✓
Drainage ✓
Land use ✓
Geology ✓
Soil ✓
Vegetation ✓

(ANY TWO- NO EXAMPLES ACCEPTED)

(2 x 1) (2)

- 4.2.3 Give a reason for your choice of ONE of the data layers identified in QUESTION 4.2.2.

LINK

Infrastructure: Easy access to the cemetery ✓✓
Relief: Flat land makes it cheaper and easier to dig graves ✓✓
Drainage: Access to water supply /Level of water table ✓✓
Land use: Away from areas that could create noise/to determine compatibility with the surroundings ✓✓
Geology: Stability of area ✓✓
Soil: Soft deep soil makes it easy to dig graves. ✓✓
Vegetation: Lack of natural vegetation ✓✓
(ANY ONE)

(1 x 2) (2)

- 4.3 Refer to block J1 on the topographic map.

- 4.3.1 What is vector data?

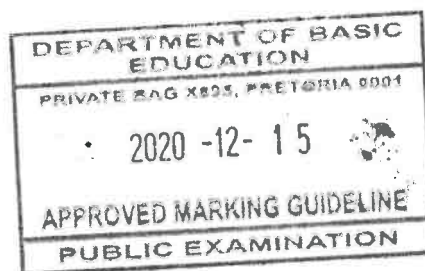
Vector data is when spatial objects are represented by points, lines and polygons (areas) ✓
(CONCEPT)

(1 x 1) (1)

- 4.3.2 Give ONE natural line feature that the farmer used to determine the site of the cultivated land in block J1.

River/non-perennial river/perennial river/stream ✓

(1 x 1) (1)



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Please turn over

IM1
[Signature]

IM2
[Signature]

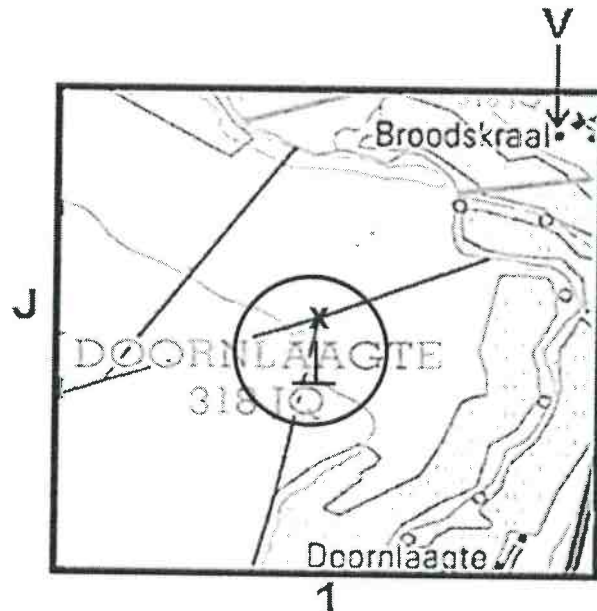
EM1
[Signature]

EM2
[Signature]

EM3
[Signature]

4.3.3 Agricultural activity in block **J1** on the topographic map is confined along the river.

- (a) Draw the symbol of the point feature that is used to extract ground water to increase water supply for agriculture, on the enlarged illustration of block **J1** below. This feature must be 40 mm southwest of the Broodskraal settlement (**V**).



Accept 1 mark for the symbol

Accept 1 mark for the location (circle indicates the accepted range)

(2 x 1) (2)

- (b) Explain the advantage of this specific location of the point feature drawn in QUESTION 4.3.3(a) for farming in the area.

Cultivation can take place away from the river ✓✓

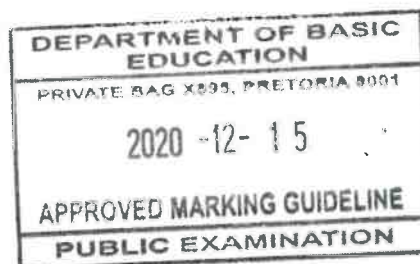
It is centrally located for accessibility to water supply ✓✓

Water table is close to surface therefore constant water supply ✓✓

Cultivated land can be extended ✓✓

(ANY ONE)

(1 x 2) (2)
[15]



TOTAL: 75

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IM 1

IM2

EM1

EM2

EM3