NATIONAL SENIOR CERTIFICATE EXAMINATION
MAY 2022

GEOGRAPHY: PAPER II

MARKING GUIDELINES

Time: 1½ hours 100 marks

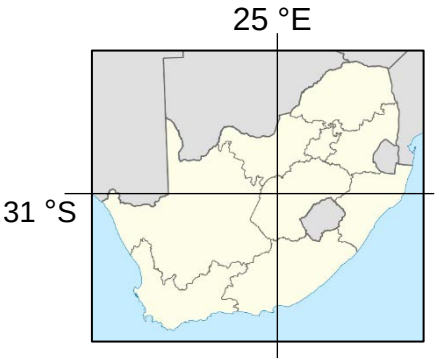
These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.

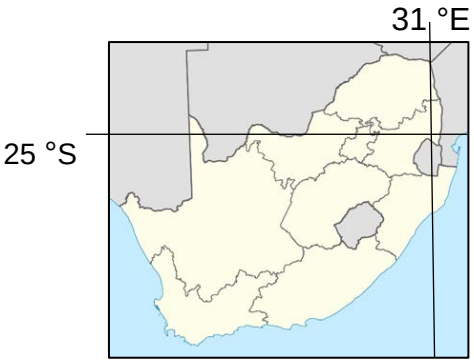
QUESTION 1 ATLAS WORK

1.1 Komatipoort can be found at the intersection of the latitude and longitude displayed on one of the maps below. Which map shows the correct position of Komatipoort, Map A or Map B?

MAP A



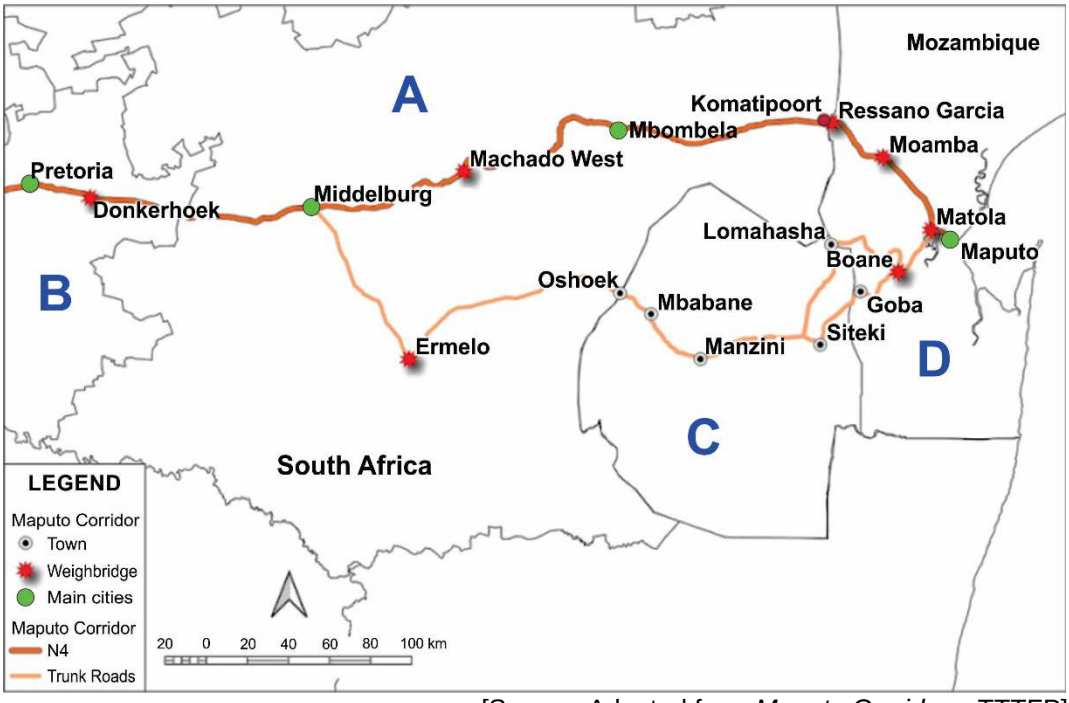
MAP B



Map A	
Map B	**X**

(1)

Figure 1: Maputo Corridor



[Source: Adapted from *Maputo Corridor* – TTTFP]

1.2 Identify the province labelled **A** in Figure 1.

Mpumalanga (1)

1.3 Name the capital of the province labelled **B** in Figure 1.

Johannesburg (1)

1.4 Identify the neighbouring country labelled **C** in Figure 1 on page 2.

Eswatini (Swaziland) (1)

1.5 The capital of the neighbouring country labelled **C** is Manzini.

Is the statement above true or false?

True	
False	**X**

(1)

1.6 Identify the climatic region at **D**. Circle the correct option.

Mediterranean savannah (sub-tropical)

(1)

1.7 Circle two options that describe the ocean current that flows along the Mozambican coast.

(warm) cold Benguela Agulhas flows north (flows south)

(2)

1.8 Use the scale bar in Figure 1 on page 2 to estimate the length of the Maputo Corridor from Pretoria to Maputo, via Komatipoort, in kilometres.

Calculations: **Scale line = 24 mm : 80 km**
= 1 mm : 3,3 km

'Paper' measurement 158 mm / thread measurement 155 mm
(Allow 153 mm to 163 mm)
158 × 3,3 = <u>521,4 km</u> / 155 × 3,3 = <u>511,5 km</u>

Answer: <u>(504,9 km to 537,9 km)</u> (2)

1.9 **Figure 2: Climate data for Komatipoort**

Climate Komatipoort – South Africa

Temperature & Rainfall

	Jan	Feb	Mar	Apr	May	Jun
Average high in °C	33	32	32	31	29	27
Average low in °C	21	21	20	17	12	8
Average rainfall in mm	99	108	70	47	17	12

	Jul	Aug	Sep	Oct	Nov	Dec
Average high in °C	27	28	30	32	32	33
Average low in °C	8	11	14	17	19	22
Average rainfall in mm	7	8	25	49	75	88

[Source: <https://www.climatedata.eu/climate.php?loc=sfzz0027&lang=en>]

1.9.1 Calculate Komatipoort's annual rainfall.

Calculations:

99 + 108 + 70 + 47 + 17 + 12 + 7 + 8 + 25 + 49 + 75 + 88

Answer: <u>605 mm</u> (2)

1.9.2 The average **high** temperature in Komatipoort is high throughout the year. Give two possible reasons for this.

- **Low altitude (Komatipoort is in the Lowveld).**
- **Relatively far north (closer to tropical regions).**
- **Not very far inland from the warm Indian Ocean.**

(Any 2) (2)

1.9.3 In which month(s) do(es) the biggest temperature range occur?

June and July
(Accept either one as they both have a temp range of 19 °C) (1)

[15]

QUESTION 2 MAP SKILL CALCULATION

2.1 Distance

Komatipoort Aerodrome can be seen in D4 and D5. Calculate the length of the runway in metres.

Calculations:	
42 mm (4,2 cm)	**(Allow 41 mm to 44 mm)**
= 2 100 m	**(2 050 m to 2 200 m)**
Map measurement (1)	
Calculation (1)	
Answer in m (1)	

Answer: <u>2 100 m</u> (3)

2.2 Area

2.2.1 Calculate the area of the cultivated field labelled **S** (marked by the red rectangle) in the southwest corner of the map. Give your answer in square metres.

Calculations: area = length × breadth

Length = **2,4 cm**

= **1 200 m**

Breadth = **1 cm (1,1 cm)**

= **500 m (550 m)**

Area = **1 200 m × 500 m**

Answer: <u>600 000 m² (660 000 m²)</u> (3)

2.2.2 How many hectares is this cultivated field? Clue: 1 hectare is 10 000 m^2.

Calculations:	
600 000 m² / 10 000 m²	**(660 000 / 10 000)**

Answer: <u>60 hectares (66 hectares)</u>

(2 marks or 0 marks) (2)

2.3 Direction and bearing

2.3.1 If you were following a bearing of 235°, in what **direction** would you be heading?

WSW (2)

2.3.2 If you were following a bearing of 235°, what would the **back bearing** be?

Calculations: **235° – 180°**

Answer: <u>55°</u> (2)

2.3.3 The 2021 magnetic declination is … (choose the correct option).

19° 23' W	
19° 33' W	
19° 43' W	**X**

(2)

2.3.4 What bearing would you be following on your compass in 2021 if the true bearing were 235°?

Calculations: **235° + 19° 43' (1)**

Answer: <u>254° 43'</u> (1) (2)

2.4 **Speed, distance, time**

You are canoeing along the Komati River at an average speed of 5 km per hour. How long will it take you to paddle from the weir in F6 to where the N4 crosses the river in E6?

Use this formula: $\text{time} = \frac{\text{distance}}{\text{speed}}$

Give your answer in minutes.

Calculations:

Map distance = 6,7 cm (allow 6,3 cm to 7,5 cm) (1)

Distance: **3,35 km (3,15 km to 3,75 km) (1)**

Speed = 5 km / hour

$$\textbf{Time} = \frac{\textbf{D}}{\textbf{S}}$$
$$= \frac{\textbf{3,35 km}}{\textbf{5 km / hr}}$$
$$= \textbf{0,67} \times \textbf{60 min (1)}$$

Answer: <u>40 minutes (40,2)</u> (Accept 38 min to 45 min) (1) (4)

[20]

QUESTION 3 MAP AND PHOTO APPLICATION

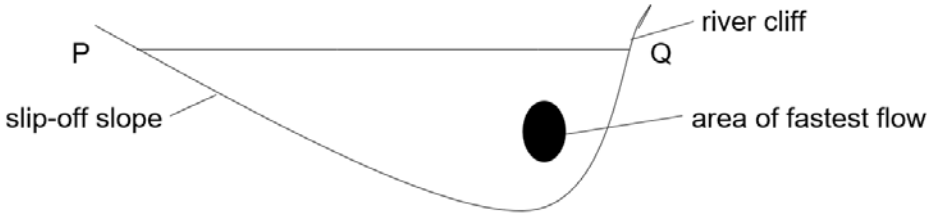
3.1 PHYSICAL GEOGRAPHY – FLUVIAL AND CLIMATE

3.1.1 (a) Identify the river feature seen in block A7 on the topographic map.

Meandering channel pattern (meander) (1)

(b) Draw a labelled sketch to show the shape of the riverbanks and bed from **P to Q** in block A7. Include the following labels:

river cliff slip-off slope area of fastest river flow



(3)

3.1.2 (a) Compare the characteristics of the Umgwenya River (block A6) with those of the Halfkroonspruit labelled **R** (block B8 to D8).

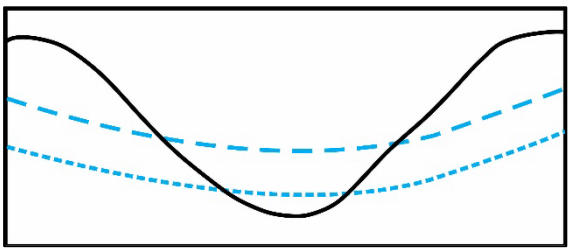
Complete the table below:

	Umgwenya River (A6)	**Halfkroonspruit (B8 to D8)**
Gradient (steep / gentle)	**Gentle**	**Steep**
Volume (high / low)	**High**	**Low**
Width of valley (wide / narrow)	**Wide**	**Narrow**
Stage of fluvial cycle (upper course / lower course)	**Lower**	**Upper**

(4)

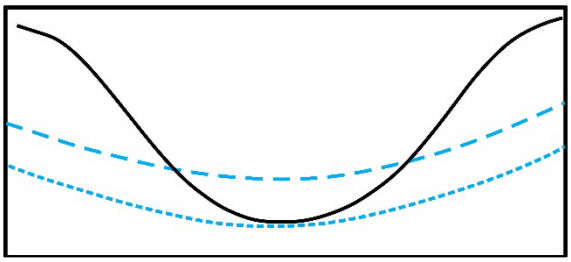
(b) The sketches below illustrate the depth of the riverbed in relation to the water table, seen in cross section.

Sketch A

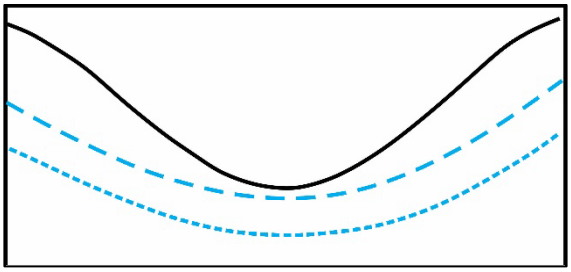


Riverbed	———
Rainy season water table	- - - -
Dry season water table	.....

Sketch B



Sketch C



Which sketch best illustrates the Umgwenya River and which sketch best illustrates Halfkroonspruit?

Complete the table below by placing an X over the label of the correct sketch.

Umgwenya River	~~Sketch A~~	Sketch B	Sketch C
Halfkroonspruit	Sketch A	~~Sketch B~~	Sketch C

(2)

3.1.3 (a) What will the wind direction be in the Halfkroonspruit valley (block B8) just before sunrise?

Northerly (N) / NE (1)

(b) Explain your answer to Question 3.1.3 (a).

- **Temperatures are coldest around sunrise because the Earth has been losing heat through terrestrial radiation.**
- **Cold land cools the air above it. This cold, dense air subsides down the valley, hence a N or NE wind direction.**

(2)

3.1.4 (a) Is the following statement True or False?

The farmhouse at The Hippo's (block F7) gets shade in the afternoon from the mountain behind it.

True	
False	**X**

(1)

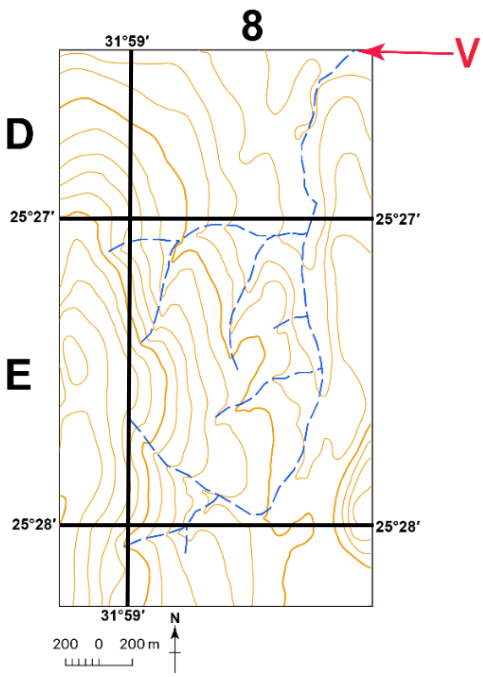
(b) Provide a reason for your answer to Question 3.1.4 (a).

- **In the afternoon when the sun is in the west, the shadow will fall to the east.**
- **But The Hippo's farm is west of the mountain and therefore will be in full sun.**

(1)

3.1.5 Determine the stream order of the non-perennial river at point **V**. Refer to Figure 3 below.

Figure 3: Detail from map extract



3rd order

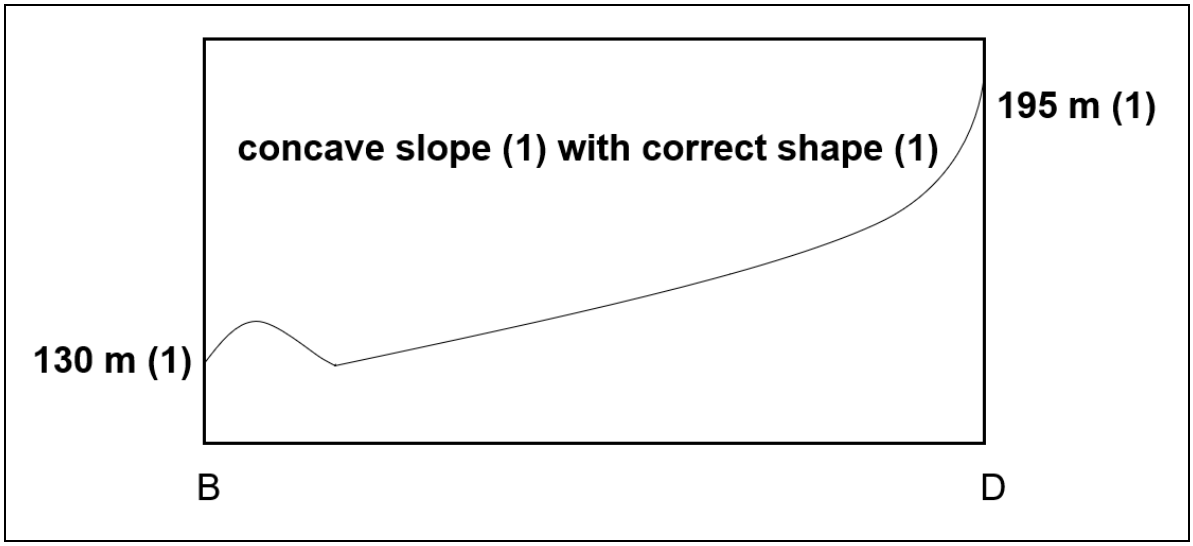
(2)

3.1.6 Identify the stream channel pattern seen at **C** on the **orthophoto map**.

Braided channel pattern. (1)

3.1.7 Draw a sketch cross section from **B** to **D** on the **orthophoto map**.

- Label the start height at **B**.
- Label the end height at **D**.
- Label the type of slope seen on the eastern side of the cross section.
- Draw the shape correctly.



(4)

[22]

3.2 HUMAN GEOGRAPHY – SETTLEMENT

3.2.1 Identify two favourable factors for the **site** of the town Komatipoort. Why are they favourable? Complete the table below:

FACTORS FAVOURING THE SITE OF KOMATIPOORT	REASON
Flat land	**Accessible** **Easy to build on**
Confluence of two perennial rivers	**Water is available all year**

(4)

3.2.2 Which terms best describe the town of Komatipoort?

Specialised town	
Gap town	**X**
Trade and transport town	**X**

(2)

3.2.3 Give evidence from the map to prove that commercial farming takes place on the western side of the map.

- **Pivot irrigation is evident – expensive to install.**
- **Farm dams.**
- **Farm boundaries and names are evidence of private land ownership.**

(Any two) (2)

3.2.4 Identify the dominant street pattern in Komatipoort, as seen on the orthophoto map.

Grid street pattern (1)

3.2.5 Identify the features on the orthophoto map at:

E: Marshalling yard (railway depot / railway lines)

F: Golf course

(2)
[11]

3.3 HUMAN GEOGRAPHY – ECONOMIC GEOGRAPHY

Read the Fact File below before answering the questions that follow.

FACT FILE

The Maputo Development Corridor (MDC)

- The MDC is the main corridor that connects the landlocked regions of South Africa (Gauteng, Mpumalanga and Limpopo) and the Kingdom of eSwatini to Mozambique and the port of Maputo. This corridor is a true transportation corridor, comprising road, rail, border posts, port and terminal facilities. (Refer to Figure 1 on page 2).
- Cross-border transporters moving commodities along the N4 highway cross into Mozambique at the Lebombo / Ressano Garcia Border Post.
- The topography of this border makes it difficult to develop or expand the border post infrastructure. As a result, the border experiences high levels of congestion, especially during peak periods (Festive Season and Easter).

[Source: Adapted from *Cross-Border Road Transport Agency* – March 2020]

Photograph 1: Congestion at the border post (6 January 2021)

[Source: *Daily Sun* (accessed 3 February 2021)]

3.3.1 List two examples of primary economic activities and one example of secondary activities found along the Maputo Development Corridor.

Primary:
- **Coal mining**
- **Fruit and sugar cane farming**

Secondary:
- **Electricity (power) generation** (3)

3.3.2 Provide map evidence to prove the statement: 'This corridor is a true transportation corridor, comprising road, rail, border posts, port and terminal facilities.' (Fact File, p. 13)

- **N4 freeway (block D5)**
- **Railway line (C1 to D8)**
- **Border post (D8)** (3)

3.3.3 Choose the option that correctly completes the statement:

The Maputo Development Corridor is an example of a / an …

industrial development zone	
spatial development initiative	**X**

(1)

3.3.4 (a) Give the block reference of the Lebombo Border Post (e.g. block A4).

D8 (1)

(b) Use map evidence to explain why the topography makes it difficult to expand and develop this border post and infrastructure. (Fact File, p. 13)

- **Narrow gap in the Lebombo mountains.**
- **Large perennial river – flood threat restricts expansion.** (2)

(c) Discuss three reasons for the high level of congestion at the border post during peak (holiday) periods. (Fact File, p. 13)

- **Regular transport of freight continues during holiday periods.**
- **Holiday makers travelling to tourist destinations in Mozambique.**
- **Migrant workers in South Africa returning home to Mozambique for the holiday period.**

(3)
[13]

QUESTION 4 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

The farm ELIM (blocks D7 to E7 on the topographic map) was advertised for sale on the Property 24 website.

Study the source material below and then answer the questions that follow.

Farm for Sale in Komatipoort **<u>Farm Elim, Lebombo, Komatipoort</u>** **39 ha.**

Commercial farm strategically located on N4 near Lebombo Border Post.

This high-intensity farm, 38,7112 hectares, on the N4 Maputo Corridor, within 2 kilometres of the Lebombo Border Post, with sugar cane and mangoes, is strategically located and has excellent potential for township establishment.

Photograph 2: Aerial view of Elim farm

[Source: Property 24 (Accessed December 2020)]

Photograph 3: Street view of Elim farm

[Source: Google Maps Street View (Accessed December 2020)]

Photograph 4

Photograph 5

[Source: Google Earth (Accessed May 2021)]

4.1 Temporal resolution

Photographs 4 and 5 on page 15 show the N4 and part of Elim farm (block D7 on the topographic map).

4.1.1 Which photograph is more current – Photograph 4 or Photograph 5?

Photograph 4 (1)

4.1.2 Give two pieces of evidence from the photographs to motivate your answer.

- **More buildings, more vehicles to the north of the N4**
- **More vegetation (crops or fruit trees) NW of the dam** (2)

4.2 Remote sensing

Identify the type of remote sensing used in Photographs 2 and 3 on page 15. Choose from the following:

vertical aerial photo satellite image high-angle oblique photo
horizontal photo low-angle oblique photo

Photograph 2: **Low-angle oblique photo**

Photograph 3: **Horizontal photo** (2)

4.3 Special Economic Zone

Read the information about Elim farm in the property advertisement on page 15.

4.3.1 Explain why the farm is *strategically* located.

- **On the N4 Freeway – on the Maputo Development Corridor.**
- **Within 2 km of the border post.** (2)

4.3.2 As an urban planner, you believe that Elim farm can be utilised as part of the Special Economic Zone that has been planned for the area.

Plans for the Special Economic Zone in Komatipoort well underway

Within the next year, residents of Komatipoort will see the start of the Special Economic Zone (SEZ) development as work on infrastructure, like a new intersection and water and sewerage plants, starts.

June 10, 2019 Retha Nel 2 minutes read

[Source: *The Lowvelder Newspaper* (Accessed December 2020)]

(a) What is a *Special Economic Zone* (SEZ)?

A zone of economic development where special allowances are made to promote economic growth, e.g., tax rebates.

(2)

(b) Name two ways in which a Special Economic Zone could contribute to the economic development of Komatipoort.

- **Increased employment**
- **Upskilling local inhabitants**
- **Improved infrastructure**
- **Influx of residents will require more shops, schools, hospitals.**

(Any 2) (2)

4.4 GIS Geoprocessing

Faecal coliform* bacteria are passed through faeces (excrement) of birds and animals. Water contaminated with faecal coliform bacteria pose health risks such as skin irritation and diarrhoea. The bacteria are measured per 100 millilitres (count / 100 ml).

Attribute Table 1: Risk of exposure to faecal coliform bacteria

Count / 100ml	Risk
Less than 10	High risk when drinking this water.
More than 400	High risk when fully or partially exposed to contaminated water (e.g., swimming).
More than 4000	High risk when crops irrigated with this water are eaten raw.

Attribute Table 2: Faecal coliform count in the Komati River

Month	Faecal coliform bacteria count per 100 ml
March	2 200
June	250
September	2 500
December	1 600

* coliform: looking like *E. coli.*

4.4.1 The data given in Attribute Tables 1 and 2 is an example of spatial data.

Is this statement True or False? **False** (1)

4.4.2 Complete the attribute table below in which you integrate the information given in Attribute Tables 1 and 2 on page 17, to illustrate the level of risk during each month given in Attribute Table 2.

Month	Count / 100 ml	Risk
March	**2 200**	**High risk when fully or partially exposed to contaminated water (e.g. swimming)**
June	**250**	**Low risk when exposed to contaminated water (concept) OR high risk when drinking this water**
September	**2 500**	**High risk when fully or partially exposed to contaminated water (e.g. swimming)**
December	**1 600**	**High risk when fully or partially exposed to contaminated water (e.g. swimming)**

(4)

4.4.3 Use the data you compiled in Question 4.4.2 to answer the following questions:

(a) During which month is it safe to drink untreated water from the Komati River?

No months / it is never safe to drink this water. (1)

(b) List two months when there would be a high risk if a person should be fully or partially exposed to faecal coliform bacteria.

- **March**
- **September**
- **December**

(Any two)

(2)
[19]

Total: 100 marks