



**education**

Department:  
Education

PROVINCE OF KWAZULU-NATAL

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**GEOGRAPHY P1 (THEORY - SECTION A) &  
GEOGRAPHY P2 (MAPWORK - SECTION B)**

**COMMON TEST**

**MARCH 2020**

**MARKS: 100 (THEORY 75 + MAPWORK 25)**

**TIME: 1½ hour (THEORY 1 hour + MAPWORK 30 minutes)**

**N.B. This section of the question paper consists of 5 pages  
and an Annexure of 4 pages.**

**INSTRUCTIONS**

1. The question paper consists of **TWO** sections: **SECTION A (Paper 1)** and **SECTION B (Paper 2)**
2. Both sections must be written in **ONE** session: 1½ hours.
3. SECTION A: Paper 1: CLIMATE AND WEATHER AND GEOMORPHOLOGY (1 HOUR)  
MARKS: 75
4. SECTION B: Paper 2: MAPWORK (30 MINUTES)  
MARKS: 25  
**(MUST BE ANSWERED ON THE QUESTION PAPER)**
5. ALL diagrams in **SECTION A** are included in the **Annexure**.
6. Answer **ALL** questions.

## SECTION A: THEORY

### QUESTION 1

1.1 Refer to **FIGURE 1.1** showing a stage in the development of a mid-latitude cyclone and answer the questions that follow.

1.1.1 Name the stage of development of the mid-latitude cyclone.

1.1.2 In which hemisphere is this mid-latitude cyclone occurring?

1.1.3 Name wind **A** and **B** respectively.

1.1.4 Identify front labelled **C**.

1.1.5 Give the high pressure region from which wind labelled **A** originates.

1.1.6 Describe the temperature of the wind labelled **B**.

1.1.7 The winds are (converging/diverging) at **C**. (8 x 1) (8)

1.2 Give ONE term for each of the following descriptions by choosing a term from the list below. Write only the term next to the question numbers (1.2.1 – 1.2.7) in your ANSWER BOOK e.g. 1.2.8 valley.

rapid;	delta ;	meander;	braided stream;
floodplain;	levee;	waterfall;	ox-bow lake

1.2.1 A vertical drop in the course of a river formed as a result of the soft rocks eroding at a faster rate than the hard rock.

1.2.2 Streams with multiple channels and sand banks between the channels.

1.2.3 Flat land on either side of a river.

1.2.4 Naturally raised banks of a river.

1.2.5 Features formed when the narrow loop of a meandor neck is bridged.

1.2.6 A fast flowing and turbulent part of a river.

1.2.7 A depositional landform, formed where a river enters the sea. (7 x 1) (7)

1.3 Refer **FIGURE 1.3** based on a Typhoon in Japan.

1.3.1 With reference to the satellite image of typhoon Hagibis:

- (a) State the hemisphere in which this cyclone occurred. (1 x 1) (1)
- (b) Give a reason for your answer in QUESTION 1.3.1 (a). (1 x 1) (1)
- (c) Identify one visible characteristic that confirms that typhoon Hagibis is in the mature stage of development. (1 x 1) (1)

1.3.2 Explain **TWO** evidence from **FIGURE 1.3** that led to typhoon Hagibis developing into a super (extremely strong) typhoon. (2 x 2) (4)

1.3.3 Write a paragraph of approximately EIGHT lines outlining precautionary measures the authorities of Japan could implement to minimize the loss of lives and damage to property caused by typhoons. (4 x 2) (8)

1.4 Refer to **FIGURE 1.4** showing city climates.

1.4.1 Define the term *urban heat island*. (1 x 1) (1)

1.4.2 Name the part of the urban area **A** that records the highest temperature. (1 x 1) (1)

1.4.3 Explain how building density contributes to the high temperatures in area **A**. (1 x 2) (2)

1.4.4 (a) Explain the term isotherm. (1 x 1) (1)

(b) Why is the shape of the isotherms unusual at area **B**? (1 x 2) (2)

1.4.5 Suggest **TWO** reasons for the drop in temperature in area **C**. (2 x 2) (4)

1.4.6 Discuss **TWO** strategies that city planners can implement to reduce the effects of urban heat island. (2 x 2) (4)

- 1.5 Refer to **FIGURE 1.5** which shows drainage patterns.
- 1.5.1 Define the term *drainage pattern*. (1 x 1) (1)
- 1.5.2 Name the drainage pattern in diagram **A** and **B** respectively. (2 x 1) (2)
- 1.5.3 Give ONE characteristic of the drainage pattern in diagram **A**. (1 x 2) (2)
- 1.5.4 What is the significance of the waterfall labelled **3** in diagram **A**? (1 x 2) (2)
- 1.5.5 Describe the underlying rock structure that influenced the development of the drainage pattern in diagram **B**. (2 x 2) (4)
- 1.5.6 Explain the factors that may result in a high drainage density in a drainage basin. (2 x 2) (4)
- 1.6 Study **FIGURE 1.6** indicating river grading.
- 1.6.1 What is the difference between a *graded* and an *ungraded river*? (2 x 1) (2)
- 1.6.2 Give ONE characteristic of a graded river seen in FIGURE 1.6. (1 x 1) (1)
- 1.6.3 Explain why a graded river has a steep gradient in the upper course and a more gradual gradient in the lower course. (2 x 2) (4)
- 1.6.4 River rejuvenation changes the fluvial features along a river's course. In a paragraph of approximately EIGHT lines, discuss how the fluvial features have changed resulting in a new river profile. (4 x 2) (8)

**TOTAL MARKS: [75]**



# education

Department:  
Education  
PROVINCE OF KWAZULU-NATAL

**GEOGRAPHY P1 (THEORY - SECTION A) &  
GEOGRAPHY P2 (MAPWORK - SECTION B)**

**ANNEXURE  
COMMON TEST**

**MARCH 2020**

**NATIONAL  
SENIOR CERTIFICATE**

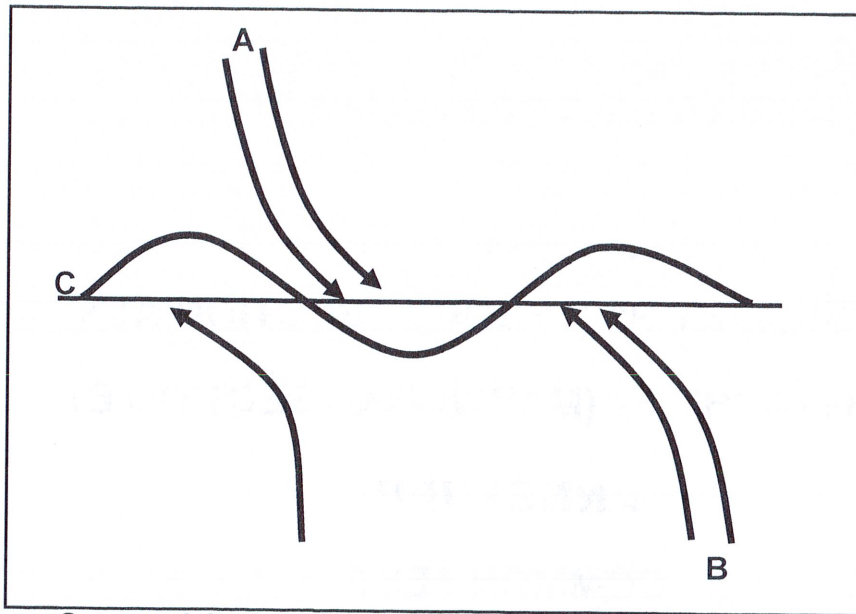
**GRADE 12**

**MARKS: 100 (THEORY 75 + MAPWORK 25)**

**TIME: 1½ hour (THEORY 1 hour + MAPWORK 30 minutes)**

**N.B. This Annexure consists of 4 pages.**

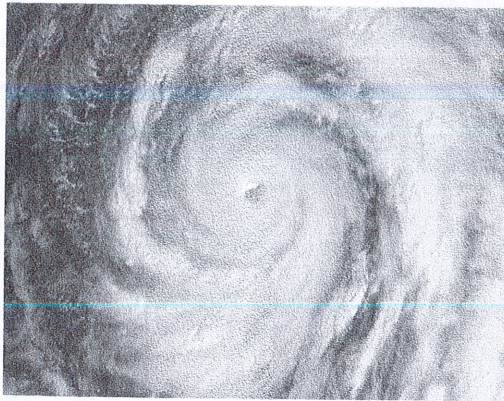
FIGURE 1.1: STAGE IN THE DEVELOPMENT OF A MID-LATITUDE CYCLONE



Source: Adapted from Southern African weather pattern

FIGURE 1.3: TYPHOON IN JAPAN

**TYPHOON HAGIBIS: DEATH TOLL RISES IN JAPAN AS 'WORST STORM IN 60 YEARS' ROARS THROUGH**



**Highest wind speed:** 259 km/h

**Fatalities:** 98 total, 7 missing

**Lowest pressure:** 915 hPa (mbar); 27.02 inHg

**Damage:** > \$15 billion (2019 USD); (Costliest Pacific typhoon in recorded history, unadjusted for inflation)

**Category:** 5

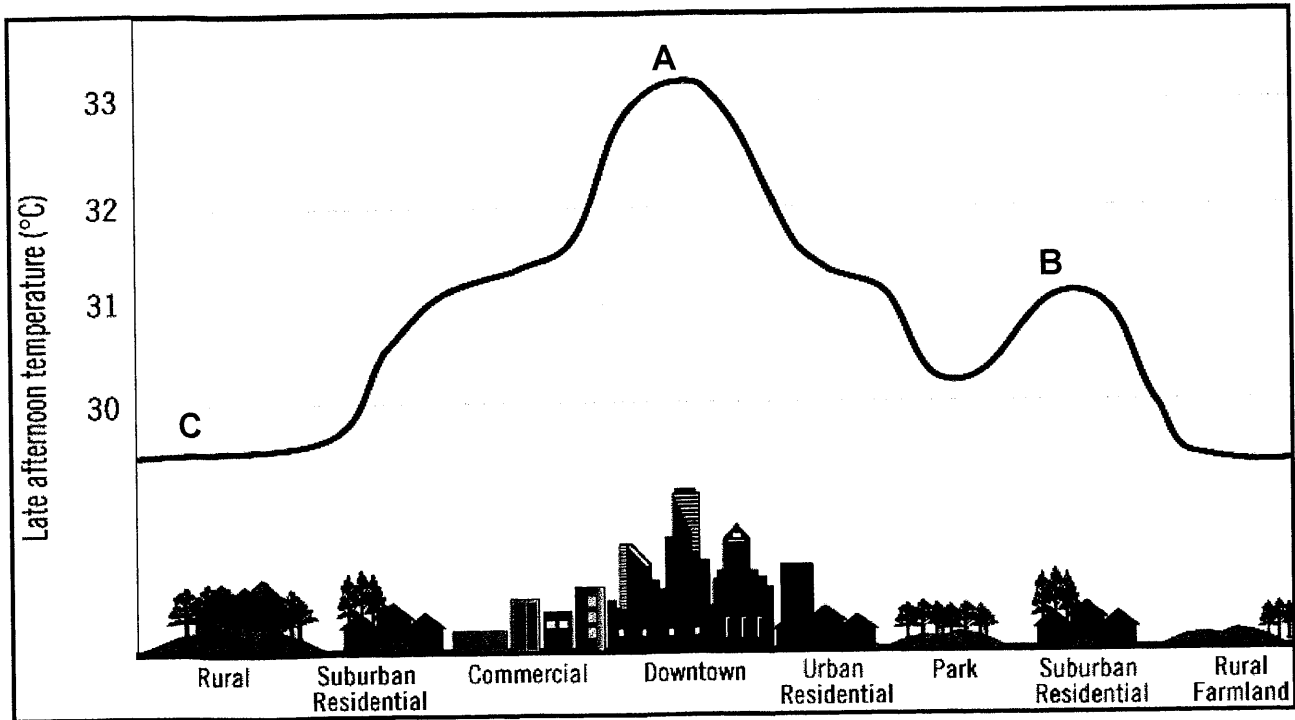
Typhoon Hagibis was an extremely violent and large tropical cyclone that caused widespread destruction across its path, starting from October 6 up until October 13 in 2019.

More than 100,000 rescue workers combed through flooded and damaged areas of central Japan after it was struck by Typhoon Hagibis, the most powerful super typhoon to hit the area. Local authorities blamed the typhoon for more than 98 deaths, with a dozen residents still listed as missing. Hagibis brought high winds and heavy rainfall, which damaged structures, collapsed dikes, flooded rivers and low-lying areas, and triggered more than 100 landslides.

Storm surges and high waves raised sea levels by 1 metre (3.2ft) along parts of the coastline, while waters in Tokyo bay are up by half a metre, increasing the danger of severe flooding in the centre of the capital.

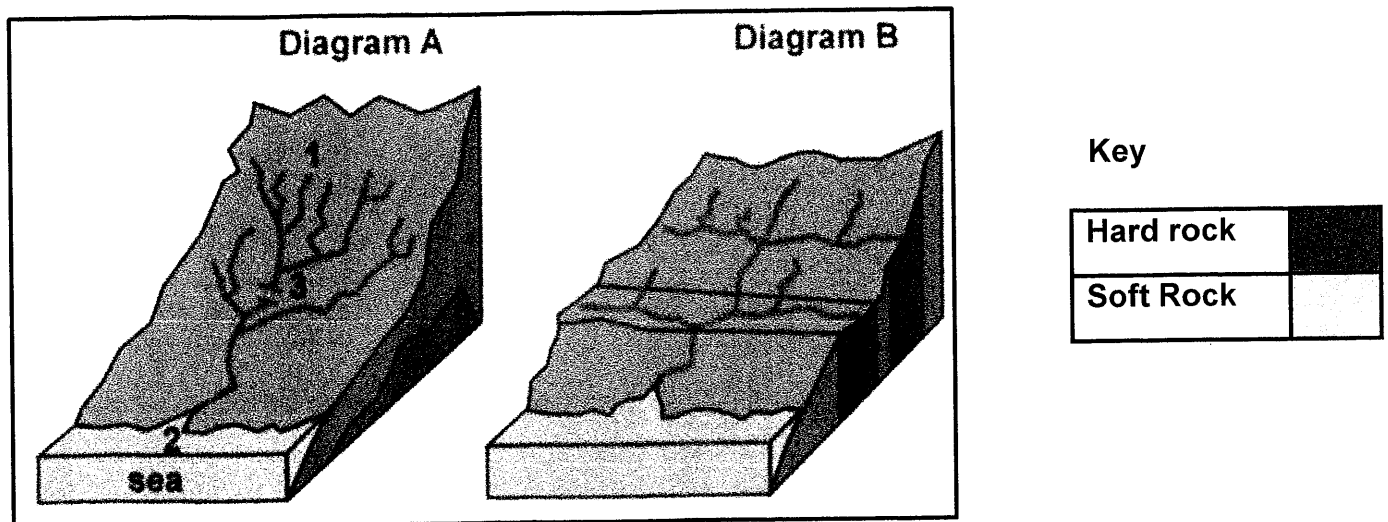
[Adapted from: <https://www.google.com>]

FIGURE 1.4: CITY CLIMATE



Source: Google Images

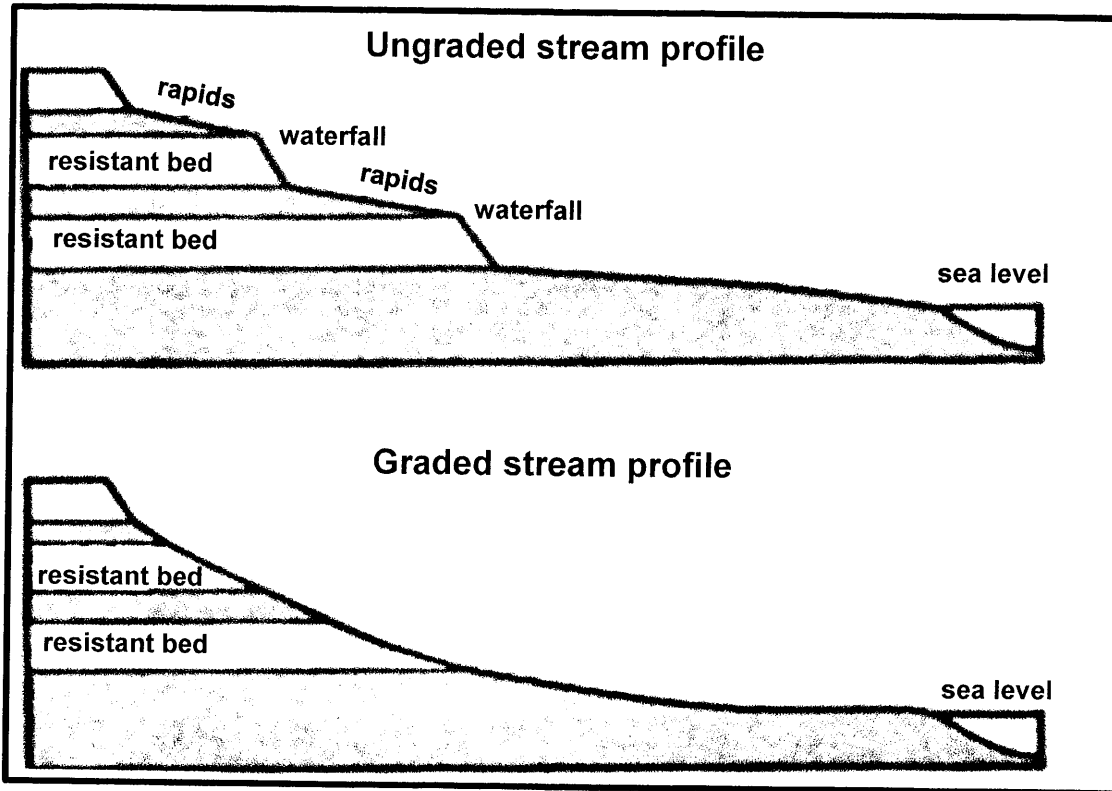
FIGURE 1.5: DRAINAGE PATTERNS



[Source: [http://drainage basin/patterns\\_images](http://drainage%20basin/patterns_images)]



FIGURE 1.6: RIVER GRADING



[Source: [www.geol.umd.edu](http://www.geol.umd.edu)]



**education**

Department:  
Education  
**PROVINCE OF KWAZULU-NATAL**

**25**

**GEOGRAPHY P2 (MAPWORK) – SECTION B**

**COMMON TEST**

**MARCH 2020**

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**MARKS: 25**

**TIME: 30 minutes**

**NAME:** \_\_\_\_\_

**DIVISION:** \_\_\_\_\_

**N.B. This section of the question paper consists of 7 pages.**

**RESOURCE MATERIAL**

1. An extract from topographical map 2731BC PONGOLA.
2. Orthophoto map 2731 BC 13 PONGOLA.
3. **NOTE:** The resource material must be collected by schools for their own use.

**INSTRUCTIONS AND INFORMATION**

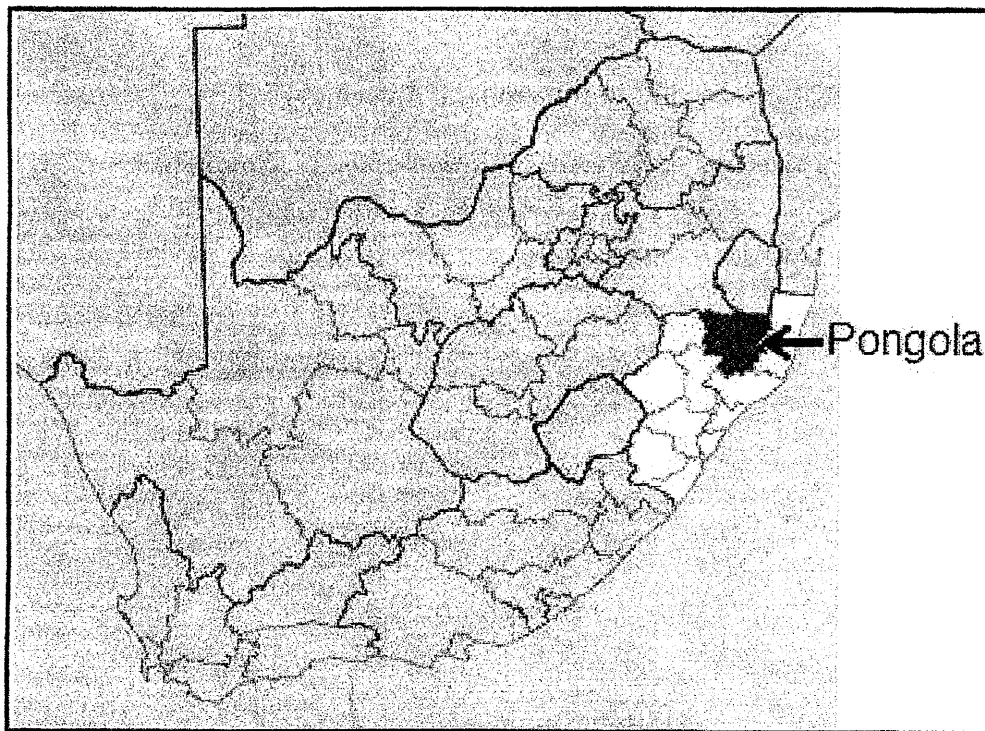
1. Write your NAME and DIVISION in the spaces on the cover page.
2. Answer ALL the questions in the spaces provided in this question paper.
3. You are provided with a 1 : 50 000 topographical map (2731BC PONGOLA) and an orthophoto map (2731 BC 13 PONGOLA) of a part of the mapped area.
4. You must hand the topographical map and the orthophoto map to the invigilator at the end of this examination session.
5. You may use the blank page at the back 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 in the final answer of calculations, eg. 10 km, 21 cm
8. You may use a non-programmable calculator.
9. You may use a magnifying glass.
10. The area demarcated in BLACK AND RED on the topographical map represents the area covered by the orthophoto map.
11. The following English terms and their Afrikaans translations are shown on the topographical map:

**ENGLISH**

Aerodome  
Caravan Park  
Canal  
Diggings  
Golf Course  
Hospital  
River  
Sewage Works  
Sugar Mill  
Waterfall

**AFRIKAANS**

Vliegveld  
Karavaanpark  
Kanaal  
Uitgrawings  
Gholfbaan  
Hospitaal  
Rivier  
Rioolwerke  
Suikermeile  
Waterval

**GENERAL INFORMATION ON PONGOLA**

Pongola (also known in IsiZulu as uPhongolo) is a small town located in northern KwaZulu-Natal, only 10 km from the Swaziland border. Pongola is surrounded by 50 km<sup>2</sup> of sugar cane subtropical fruit plantations. The town thrived as a result of the irrigation (canal) system and a sugar mill. Pongola is situated in a tranquil subtropical environment and normally received about 519 mm of rain per year, with most rainfall in summer.

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

**SECTION B: MAPWORK****QUESTION 1: MULTIPLE-CHOICE QUESTIONS**

The questions below are based on the 1:50 000 topographical map 2731BC PONGOLA, as well as the orthophoto map 2731 BC 13 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 PONGOLA is located in the ... province.

- A Kwazulu-Natal
- B Gauteng
- C Free State
- D Eastern Cape

1.2 The index sheet south of 2731BC 12 on the orthophoto map is ...

- A 2731BC 13.
- B 2731BC 17.
- C 2731BC 7.
- D 2731DA.

1.3 The difference in height between N and M on the topographical map is ... meters

- A 937
- B 936
- C 142
- D 142.8

1.4 The approximate rainfall experienced by Pongola is ... mm per year

- A 519
- B 200
- C 900
- D 1000

1.5 The point labelled **K** on the topographical map is a/an ...

- A interfluve.
- B catchment.
- C confluence.
- D watershed.

**5 x 1 [5]**

**QUESTION 2: MAPWORK TECHNIQUES AND CALCULATIONS**

2.1 Calculate the distance, in kilometers, between spot height 269 labeled **6** and spot height 259 labelled **5**, on the orthophoto map.  
Show all calculations.

---

---

---

(2 x 1) (2)

2.2 Calculate, in meters, the average area of the cemetery found in the demarcated circle **O** on the topographical map  
Show ALL calculations. Marks will be awarded for calculations.

**Formula: Area = length (L) x breadth (B)**

---

---

---

---

---

---

(4 x 1) (4)

2.3 Determine the stream order at **K** in Block **F3**.

---

---

(1 x 1) (1)

**[7]**

**QUESTION 3: APPLICATION AND INTERPRETATION**

3.1 Refer to the settlements located in the valley along the N2 between **N** and **M** on the orthophoto map

3.1.1 Name the wind that will impact on the settlements, at night.

\_\_\_\_\_ (1 x 1) (1)

3.1.2 Suggest how these winds, mentioned in QUESTION 3.1.1 would negatively impact on the health of people living in the valley, along the N2, between **N** and **M**

\_\_\_\_\_  
\_\_\_\_\_ (1 x 2) (2)

3.2 Refer to Ncotshane River to the north east of the orthophoto map (Block 8 of the topographical map)

3.2.1 Name the fluvial feature represented by line 2 – 3.

\_\_\_\_\_ (1 x 1) (1)

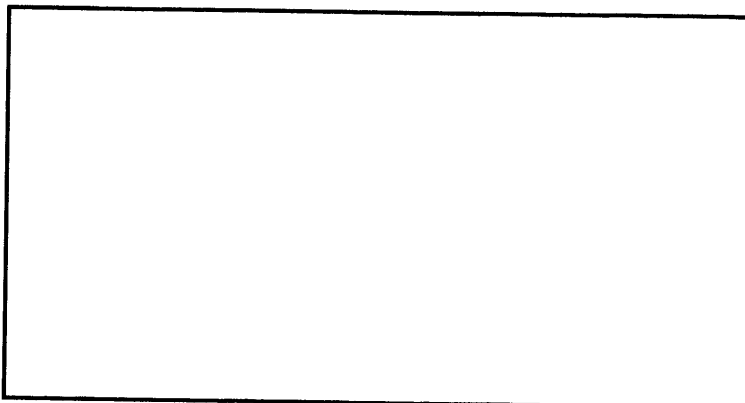
3.2.2 Give a reason to support your answer to QUESTION 3.2.1.

\_\_\_\_\_ (1 x 1) (1)

3.3

3.3.1 Draw a rough cross section of the Ncotshane river between points 2 and 3. Include in the above diagram the following labels:

- (a) undercut slope
- (b) slip-off slope



(3 x 1) (3)

**[8]**

**QUESTION 4: MAP PROJECTION AND GEOGRAPHICAL INFORMATION SYSTEMS**

4.1 Refer to block **H7** on the topographical map.

4.1.1 Vector data refer to real life images in the form of points, lines and polygons.

Identify the following data in block **H7**:

A point feature related to altitude:

\_\_\_\_\_

A line feature that creates accessibility:

\_\_\_\_\_

A polygon feature related to farming:

\_\_\_\_\_

(3 x 1) (3)

4.1.2 Explain how the polygon feature mentioned in QUESTION 4.1.1 advantaged farming activities in the area.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(1 x 2) (2)

**[5]**

**TOTAL MARKS: [25]**



**SECTION A**

**QUESTION 1**

1.1 1.1.1 Wave stage (Initial) ✓

1.1.2 Southern ✓

1.1.3 A - Tropical Westerly (Sub)/North Westerly ✓  
B - Polar easterlies /South Easterly ✓

1.1.4 Polar front ✓

1.1.5 Sub-tropical high ✓

1.1.6 cold ✓

1.1.7 converging ✓

1.2 1.2.1 waterfall ✓

1.2.2 braided stream ✓

1.2.3 flood plain ✓

1.2.4 levee ✓

1.2.5 Ox-bow lake ✓

1.2.6 rapid ✓

1.2.7 delta ✓

(8 x 1) (8)

(7 x 1) (7)

- 1.3 1.3.1 (a) Northern ✓ (1 x 1) (1)
- (b) Anticlockwise air circulation ✓ (1 x 1) (1)
- (c) Presence of the eye ✓ (1 x 1) (1)
- 1.3.2 Wind speed of 259 km/h ✓  
Extremely low pressure / 915 hpa ✓ (2 x 2) (4)

- 1.3.3 Effective use of satellite imagery to track storms ✓✓  
Air radar and remote sensing ✓✓  
Early warning systems ✓✓  
Emergency rescue services ✓✓  
Extensive sea walls ✓✓  
Use of sand bags along coastal areas ✓✓  
Build houses on stilts ✓✓  
Strong building material ✓✓  
Flood proofing by building artificial levees ✓✓  
Good communications ✓✓  
Clear evacuation routes ✓✓  
Establishing evacuation centers ✓✓  
Extensive medical and paramedic provision ✓✓  
Storm warden patrols ✓✓  
Good weather forecasts ✓✓  
Efficient drainage systems ✓✓  
Moving away from low lying areas ✓✓  
Planting of trees to reduce the impact of flooding ✓✓  
**[ANY FOUR]**

(4 x 2) (8)

1.4

1.4.1 An urban area that records higher temperatures than the surrounding rural areas ✓  
**[Concept]**

(1 x 1) (1)

1.4.2 Downtown/Central Business District/City centre ✓

(1 x 1) (1)

1.4.3 High density of tall buildings trap heat as wind cannot disperse the heat. ✓✓

(1 x 2) (2)

1.4.4 (a) Lines drawn on a map joining places of equal temperatures. (Concept) (1 x 1) (1)

(b) A cluster of high rise buildings (flats and hotels) results in higher temperature. ✓✓  
Use of more artificial heat emitters. ✓✓  
**(Any ONE)**

(1 x 2) (2)

- 1.4.5 Presence of vegetation resulting in greater evapotranspiration. ✓✓  
More exposed surface water resulting in evaporation, lowering temperatures. ✓✓  
More exposed soil surfaces reduce the effect of heat. ✓✓  
Low building density in rural areas. ✓✓  
(Any TWO) (2 x 2) (4)

- 1.4.6 Industrial / Commercial decentralisation ✓✓  
Law enforcement to ensure sustainable units/agenda 21 ✓✓  
Introduce open space/green belts/parks to absorb carbon dioxide ✓✓  
Reduce building density ✓✓  
Laws to restrict or control air pollution ✓✓  
Erect green buildings ✓✓ / roof top gardens ✓✓ / Horticulture ✓✓  
Use lighter colour paints ✓✓  
Erect glass buildings ✓✓  
Construction off water features such as fountains/waterways ✓✓  
[Any TWO] (2 x 2) (4)

1.5

- 1.5.1 Surface arrangement formed by a river and its tributaries ✓  
[Concept] (1 x 1) (1)

- 1.5.2 A Dendritic ✓  
B Trellis ✓ (2 x 1) (2)

- 1.5.3 Tributaries join main stream at acute/small angles ✓✓  
Looks like branches of a tree ✓✓  
Flows over uniform resistant rock ✓✓  
[Any ONE] (1 x 2) (2)

- 1.5.4 An indication that vertical erosion/rejuvenation has taken place ✓✓  
It forms tourist attraction ✓✓  
Can be used to generate hydro-electricity ✓✓  
Aesthetic phenomenon/feature ✓✓  
[Any ONE] (1 x 2) (2)

- 1.5.5 Folded sedimentary rock ✓✓  
Rock is inclined ✓✓  
Alternate hard and soft rocks ✓✓  
Rock strata has different resistance to erosion ✓✓  
[Any TWO] (2 x 2) (4)

- 1.5.6 Hard rock that promotes run-off and the formation of streams ✓✓  
High rainfall increases run-off and more streams form ✓✓  
Low rock porosity limits infiltration and increased run-off forming streams ✓✓  
Low rock permeability limits infiltration and increased run-off forming streams ✓✓  
No vegetation increases run-off and streams develop ✓✓  
Steeper gradients increase run-off and more streams develop ✓✓  
[Any TWO] (2 x 2) (4)

1.6

- 1.6.1 Graded river a river that flows in a smooth profile; ✓ there are no obstacles in the profile; ✓ erosion and deposition are in equilibrium ✓  
(Concept) (2 x 1) (2)

Ungraded river a river that flows on an uneven surface; ✓ there are many obstacles along the course of the river; ✓ shows a multi-concave longitudinal profile; ✓ erosion and deposition are not in equilibrium ✓  
(Concept) [Any ONE value from the answers given above, must be compared]

- 1.6.2 Has a smooth, concave longitudinal profile ✓  
In a smooth profile, the rate of erosion is equal to the rate of deposition ✓  
[Any ONE] (1 x 1) (1)

1.6.3 TECHNICAL ERROR – QUESTION REMOVED

- 1.6.4 A knickpoint is a break in the slope of a river profile caused by a rejuvenated river. A knickpoint is often a waterfall. ✓✓  
When rejuvenation of a river flowing on a wide valley occurs, a new valley is carved into the old valley. ✓✓  
The floor of the old valley forms a terrace on either side of the valley after rejuvenation. ✓✓  
Incised meanders/gorges form when rejuvenation occurs in a stream which is already meandering. ✓✓  
Incised meanders can also form oxbow lakes and cut-off meander scars. ✓✓  
[Any FOUR] (4 x 2) (8)

[71]

**QUESTION 1: MULTIPLE-CHOICE QUESTIONS**

The questions below are based on the 1:50 000 topographical map 2731BC PONGOLA, as well as the orthophoto map 2731 BC 13 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 PONGOLA is located in the ... province.
  - A Kwazulu-Natal
  - B Gauteng
  - C Free State
  - D Eastern Cape

A✓
  
- 1.2 The index sheet south of 2731BC 12 on the orthophoto map is ...
  - A 2731BC 13.
  - B 2731BC 17.
  - C 2731BC 7.
  - D 2731DA.

B✓
  
- 1.3 The difference in height between N and M on the topographical map is ... meters
  - A 937
  - B 936
  - C 142
  - D 142.8

D✓
  
- 1.4 The approximate rainfall experienced by Pongola is ... mm per year
  - A 519
  - B 200
  - C 900
  - D 1000

A✓
  
- 1.5 The point labelled K on the topographical map is a/an ...
  - A interfluv.
  - B catchment.
  - C confluence.
  - D watershed.

C✓

(5 x 1) [5]

**QUESTION 2: MAPWORK TECHNIQUES AND CALCULATIONS**

2.1 Calculate the distance, in kilometers, between spot height 269 labeled 6 and spot height 259 labelled 5, on the orthophoto map. Show all calculations.

13.3✓ cm x 0,1 = 1.33✓ km  
 (Measurement range: 13.2 to 13.4)  
 (Answer range: 1.32 to 1.34)

(2 x 1) (2)

2.2 Calculate, in meters the area of the cemetery found in the demarcated circle O on the topographical map. Show ALL calculations. Marks will be awarded for calculations.

Formula: Area = length (L) x breadth (B)  
 L = 0,6 x 500 = 300✓ Range (0,5 – 0,7)  
 B = 0,3 x 500 = 150✓ Range (0,2 – 0,4)  
 L x B = 300 x 150✓  
 = 45 000 m<sup>2</sup> ✓  
 (Range= 25 000 – 70 000 m<sup>2</sup>)

(4 x 1) (4)

2.3 Determine the stream order at K in Block F3.  
 2<sup>nd</sup> order ✓

(1 x 1) (1)

17

**QUESTION 3: APPLICATION AND INTERPRETATION**

3.1 Refer to the settlements located in the valley along the N2 between N and M on the topographical map

3.1.1 Name the wind that will impact on the settlements, at night.

**TECHNICAL ERROR – QUESTION REMOVED**

3.1.2 Suggest how these winds, mentioned in QUESTION 3.1.1 would negatively impact on the health of people living in the valley, along the N2, between N and M.

**TECHNICAL ERROR – QUESTION REMOVED**

3.2 Refer to Ncotshane River to the north east of the orthophoto map (Block 8 of the topographical map)

3.2.1 Name the fluvial feature represented by line 2 – 3.

meander✓

(1 x 1) (1)

3.2.2 Give a reason to support your answer to QUESTION 3.2.1.

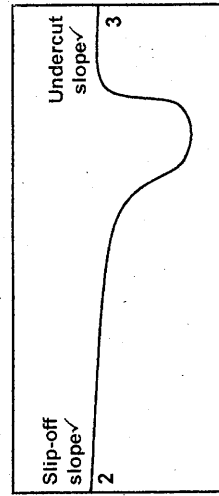
Bend or curve in the river✓

(1 x 1) (1)

3.3

3.3.1 Draw a rough cross section of the Ncotshane river between points 2 and 3. Include in the above diagram the following labels:

- (a) undercut slope
- (b) slip-off slope



(3 x 1) (3)

[8]

**QUESTION 4: MAP PROJECTION AND GEOGRAPHICAL INFORMATION SYSTEMS**

4.1 Refer to block H7 on the topographical map.

4.1.1 Vector data refer to real life images in the form of points, lines and polygons.

Identify the following data in block H7:

A point feature related to altitude: Trigonometrical station ✓

A line feature that creates accessibility: Other road ✓

A polygon feature related to farming: Perennial water/Dam ✓ (3 x 1)(3)

4.1.2 Explain how the polygon feature mentioned in QUESTION 4.1.1 advantaged farming activities in the area.

Provides water for irrigation✓✓ (1 x 2)(2) [5]

TOTAL MARKS: [22]

Calculation : Learners mark x 100  
93