

SA's Leading Past Year

Exam Paper Portal



You have Downloaded, yet Another Great Resource to assist you with your Studies 😊

Thank You for Supporting SA Exam Papers

Your Leading Past Year Exam Paper Resource Portal

Visit us @ www.saexampapers.co.za



**SA EXAM
PAPERS**
SA EXAM
PAPERS



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA
DEPARTMENT OF
EDUCATION

VHEMBE WEST DISTRICT

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

GEOGRAPHY

PRE-TRIAL EXAMINATION

12 AUGUST 2024

MARKS: 150

DURATION: 3 HOURS

This question paper consists of 18 pages



SA EXAM
PAPERS

INSTRUCTIONS AND INFORMATION

1. The question paper consists of TWO SECTIONS.

SECTION A

QUESTION 1: Climate and weather (60)

QUESTION 2: Geomorphology (60)

SECTION B

QUESTION 3: Geographical Skills and Techniques (30)

2. Answer all THREE questions.
3. All diagrams are included in the QUESTION PAPER.
4. Leave a line between the subsections of questions answered.
5. Start EACH question at the top of A NEW page.
6. Number the answers correctly according to the numbering system used in this question paper.
7. Answer in FULL SENTENCES, except when you have to state, name, identify or list.
8. Units of measurement MUST be indicated in your final answer e.g. 12 km, 10 metres, 4%.
9. You may use a non-programmable calculator.
10. You may use a magnifying glass
11. Write neatly and legibly

SPECIFIC INSTRUCTIONS AND INFORMATION FOR SECTION B

12. 1: 50 000 topographic map 2930CA MERRIVALE and a 1: 10 000 orthophoto map 2030 CA 5 MERRIVALE are provided.
13. The area demarcated in RED/BLACK on the topographical map represents the area covered by the orthophoto map.
14. Show all calculations. Marks will be allocated for steps in calculations.
15. You must hand in the topographical and orthophoto map to the invigilator at the end of the examination.



SECTION A: CLIMATE, WEATHER AND GEOMORPHOLOGY**QUESTION 1: CLIMATE AND WEATHER**

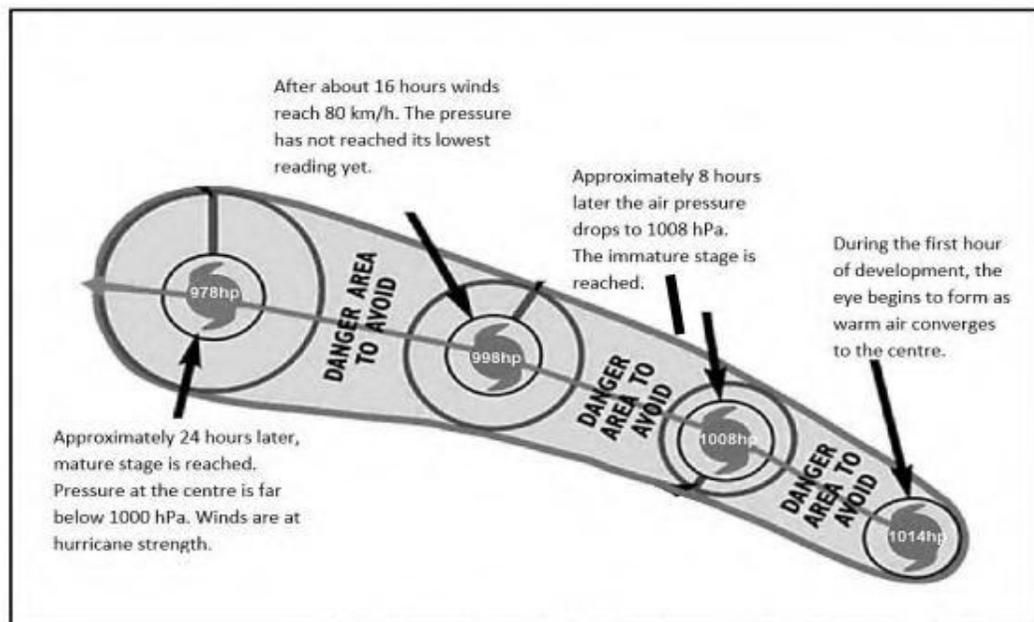
- 1.1 Complete the statements in COLUMN A with the options in COLUMN B. Write .only X or Y next to the question numbers (1.1.1 to 1.1.7) in the ANSWER BOOK, e.g. 1.1.8 Y.

	COLUMN A	COLUMN B
1.1.1	The climate of a small area such as valley climate	X Micro- climate Y Macro-climate
1.1.2	Winds which are also known as katabatic winds	X Down-slope Y Up-slope
1.1.3	Heating occurs, and warm air rises from the valley floor towards the crest causing anabatic winds during this time	X Day Y Night
1.1.4	The belt where the warm air accumulates midway up the valley	X Radiation belt Y Thermal belt
1.1.5	It is formed on the valley floor when the temperature falls below freezing point.	X Frost pocket Y Fog pocket
1.1.6	Associated with radiation fog in the valley.	X Calm conditions Y Rapid winds
1.1.7	The values of property on the warmer middle slope compared to the ones on the valley floor.	X Higher Y lower

(7 x 1) (7)

- 1.2 Refer to FIGURE 1.2, the Tropical Cyclone Edouard. Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.2.1–1.2.8) in the ANSWER BOOK, for example 1.2.9 A

FIGURE 1.2, the Tropical Cyclone Edouard.



[Adapted from <https://nauticalclass.com/what-actions-vessel-should-take>]

- 1.2.1 Tropical Cyclone Edouard was the... cyclone of the season.

- A 2nd
- B 5th
- C 6th
- D 9th

- 1.2.2 The movement of the air around the low pressure in the centre of the weather system is proof that this tropical cyclone occurred in the ... hemisphere.

- A southern
- B northern
- C western
- D eastern



1.2.3 The centre of the weather system is known as the ... of the tropical cyclone.

- A cortex
- B hurricane
- C eye
- D moisture front

1.2.4 The reason for the calm weather in the centre of the tropical cyclone is ...

- A subsiding air that warms adiabatically.
- B subsiding air that cools adiabatically.
- C ascending air that warms adiabatically.
- D ascending air that cools adiabatically.

1.2.5 The path of the tropical cyclone is from ...

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

1.2.6 The possible wind speed at approximately 24 hours is ... km/h.

- A 10
- B 50
- C 100
- D 130

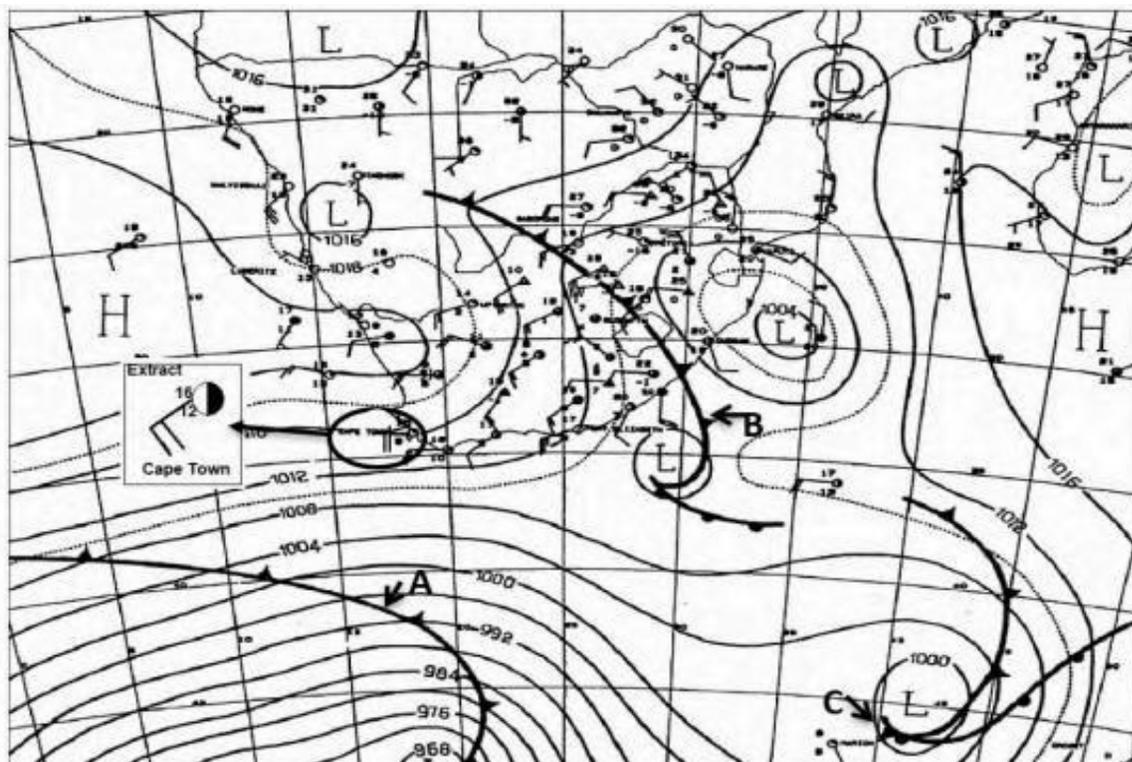
1.2.7 It took approximately ... hours for the tropical cyclone to reach the mature stage

- A 0
- B 2
- C 8
- D 24



1.3.1 Refer to FIGURE 1.3 which shows mid-latitude cyclones on a synoptic weather map.

FIGURE 1.3 MID-LATITUDE CYCLONES



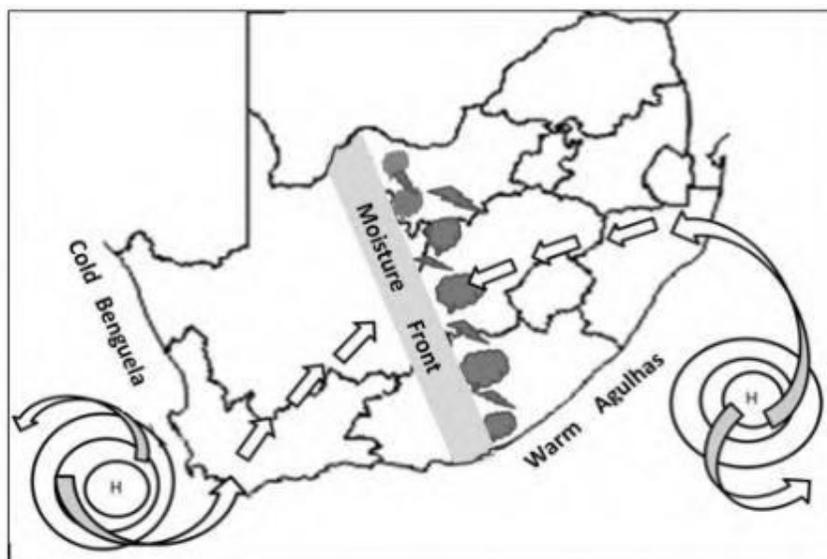
[Adapted from Surface-synoptic-weather-map]

- 1.3.1 Which season is represented on the synoptic weather map in FIGURE 1.3? (1 x 1) (1)
- 1.3.2 At what stage of development is mid-latitude cyclone **C**? (1 x 1) (1)
- 1.3.3 Give evidence from the synoptic map to support your answer to QUESTION 1.3.2. (1 x 2) (2)
- 1.3.4 (a) Which mid-latitude cyclone, **A**, **B** or **C** is the oldest? (1 x 1) (1)
- (b) Give TWO reasons for your answer to QUESTION 1.3.4 (a). (2 x 2) (4)
- 1.3.5 Refer to the extract of the station model of Cape Town. Explain the change in temperature, wind direction and cloud cover as the cold front of mid-latitude cyclone **A** approaches Cape Town. (3 x 2) (6)

/15/

1.4 FIGURE 1.4 shows a line thunderstorm.

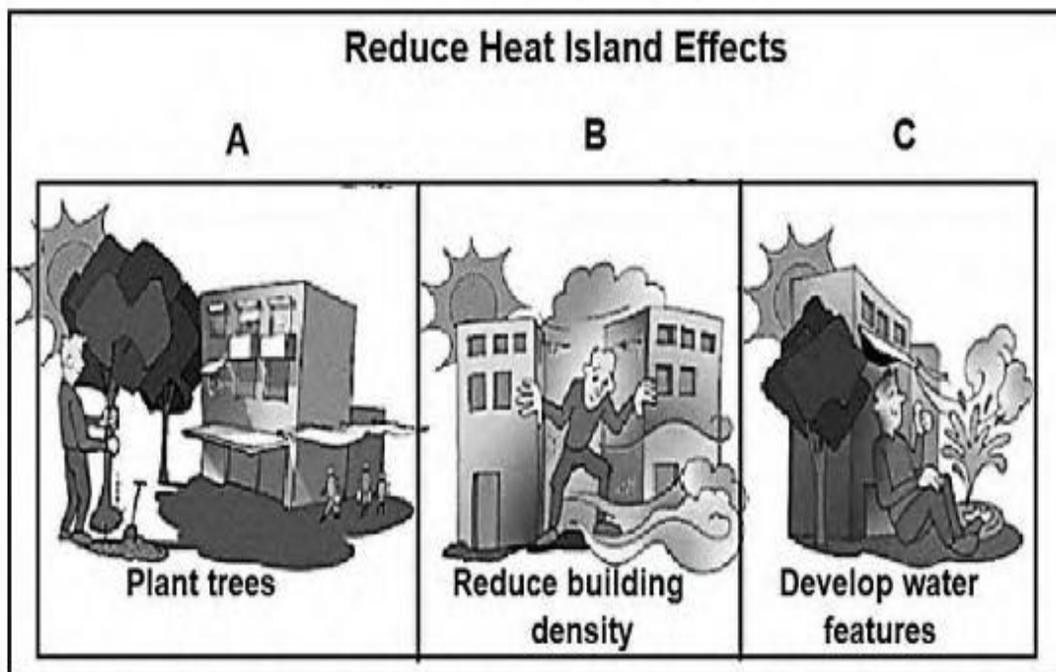
FIGURE 1.4 LINE THUNDERSTORM



- 1.4.1 In which season do line thunderstorms develop over South Africa? (1 x 1) (1)
- 1.4.2 Describe the air that flows from the:
- (a) South Indian Anticyclone (1 x 2) (2)
- (b) South Atlantic Anticyclone (1 x 2) (2)
- 1.4.3 On which side of the moisture front do line thunderstorms occur? (1 x 1) (1)
- 1.4.4 Give a reason for your answer to QUESTION 1.4.3. (1 x 2) (2)
- 1.4.5 In a paragraph of approximately EIGHT lines, suggest the positive and negative impact that line thunderstorms have on the agricultural sector in the interior of South Africa. (4 x 2) (8)
- (16)**

- 1.5 Refer to FIGURE 1.5 that shows methods to reduce the effects of an Urban Heat Island.

FIGURE 1.5 URBAN HEAT ISLAND



[Adapted source: <https://www.google.com/search?q=hitte+eiland&safe=strict&rlz=1C1GCEU>]

- 1.5.1 Define the term *Urban Heat Island*. (1 x 2) (2)
- 1.5.2 Describe how the glass windows in FIGURE 1.5, will result in the increase in temperature in the urban area. (1 x 2) (2)
- 1.5.3 Explain TWO possible negative effects that Urban Heat Islands have on the health of human beings. (2 x 2) (4)
- 1.5.4 Explain how the THREE strategies (**A**, **B** and **C**), evident in FIGURE 1.5, contributed to the reduction of the Heat Island Effect. (3 x 2) (6)
- (14)**
[60]

QUESTION 2: GEOMORPHOLOGY

2.1 Read the following statements on the characteristics of a drainage basin and choose the appropriate word(s) in brackets which will make the statement TRUE. Write down only the question number (2.1.1 to 2.1.7) and the answer in your ANSWER BOOK, e.g. 2.1.8 Dendritic.

2.1.1 The point where the tributary joins the main river is known as the (source/confluence).

2.1.2 The total area of land drained by the river and its tributaries is known as the (drainage basin/catchment area).

2.1.3 A (river system/drainage pattern) is the main river with all its tributaries.

2.1.4 The surface area that captures rainfall is known as the (drainage basin/catchment area).

2.1.5 The tributary of a river is a result of (surface runoff/infiltration).

2.1.6 The (watershed/interfluvium) is a spur that separates two tributaries of the same river system.

2.1.7 The upper layer of underground saturated rock is referred to as the (ground water/aquifer)

(7 x 1) (7)



- 2.2 Choose a term from COLUMN B that matches the geomorphologic description of fluvial landforms in COLUMN A. Write only the letter (A–I) next to the question number (2.2.1 to 2.2.8) in the ANSWER BOOK, e.g. 2.2.9 J.

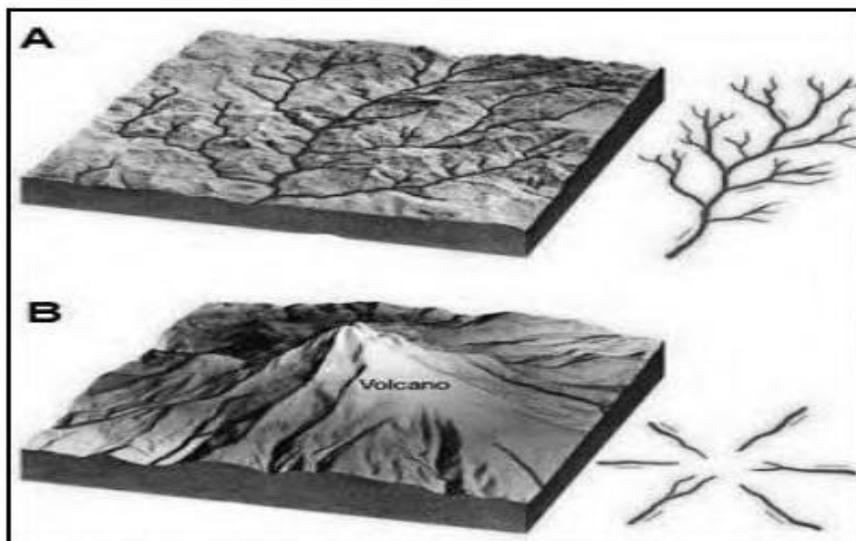
COLUMN A		COLUMN B	
2.2.1	The splitting of a river into different streams due to a slow-moving river depositing alluvium at the mouth	A	Levees
		B	Terraces
2.2.2	Low-lying ground adjacent to a river in the lower course	C	Delta
		D	Distributaries
2.2.3	This fluvial landform forms due to a knickpoint	E	Floodplain
2.2.4	Steps on the sides of a river as it erodes its own floodplain through rejuvenation	F	Waterfall
		G	Meander
2.2.5	A fluvial landform resulting from a slow moving river depositing alluvium before it enters the sea	H	Gorge
		I	Meander scar
2.2.6	This feature forms when an ox-bow lake dries up		
2.2.7	A very steep sided valley where a river flows at the bottom		
2.2.8	The winding pattern of a river that results in lateral erosion		

(8 x 1) (8)



2.3 Refer to FIGURE. 2.3 that shows the different types of drainage patterns.

FIGURE 2.3 DRAINAGE PATTERNS

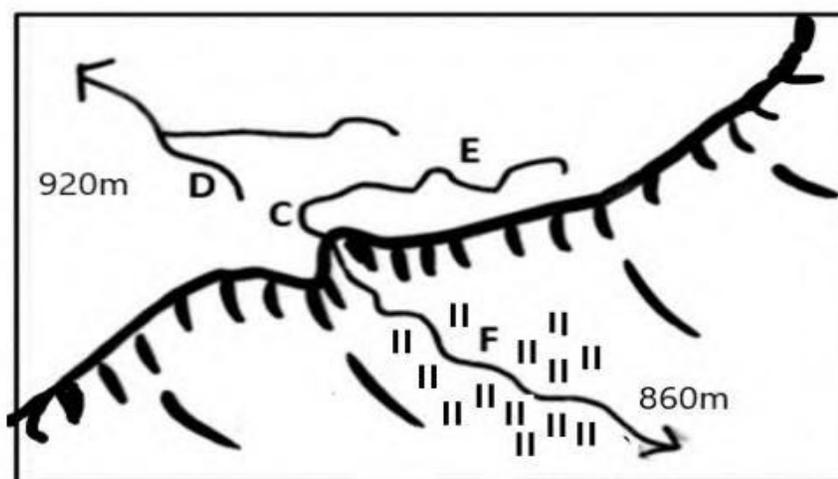


[Source: Adapted from <http://www.geologyin.com/2014/03/drainage-pattern.html?m=3>]

- 2.3.1 Identify drainage patterns **A** and **B**. (2 x 1) (2)
- 2.3.2 What is the dominant physical factor that determines the development of different types of drainage patterns? (1 x 1) (1)
- 2.3.3 Give TWO visible characteristics of drainage pattern **A** in FIGURE 2.3. (2 x 1) (2)
- 2.3.4 Why would farming be more suitable in an area with drainage pattern **A**? (2 x 2) (4)
- 2.3.5 Explain how physical factors limit the effective use of water in drainage pattern **B**. (3 x 2) (6)
- (15)**

2.4 Refer to FIGURE 2.4 that shows river capture.

FIGURE 2.4 RIVER CAPTURE



[Source: Examiner's own sketch]

- 2.4.1 Define the concept *river capture*. (1 x 2) (2)
- 2.4.2 Name the main physical factor (natural factor) visible in FIGURE 2.4 that resulted in river capture taking place. (1 x 1) (1)
- 2.4.3 Identify the features of river capture labelled **C** and **D** in FIGURE 2.4. (2 x 1) (2)
- 2.4.4 State the impact that river capture will have on the volume of water in rivers **D** and **F**. (1 x 1) (1)
- 2.4.5 Discuss how the process of river capture has led to the rejuvenation of river **F**. (2 x 2) (4)
- 2.4.6 Explain the negative impact that rejuvenation will have on the economic activity visible next to river **F** on FIGURE 2.4. (2 x 2) (4)
- (14)**

- 2.5 Study the extract on Gauteng River Catchment Management in FIGURE 2.5.

FIGURE 2.5. Gauteng River Catchment Management

Gauteng is located on the continental divide with some rivers flowing towards the Indian Ocean and others to the Atlantic Ocean. It contains the headwaters of a number of important river systems in an urban environment.

The high flow velocity of the river causes erosion especially where vegetation cover is removed, or the banks of rivers and streams are modified. Seasonal flooding is a real danger in several extensive areas in Gauteng. Canalisations of several rivers in urban as well as rural areas have further negative effects.

Healthy riverbanks maintain the form of the river channel, provide habitat for species (aquatic and terrestrial) and filter sediment, minerals and light. Water quality includes the chemical, physical and bacteriological properties of water which determine its suitability for use.

The urban nature of Gauteng (especially the central part) as well as road networks across the province seals natural surfaces in a manner that does not allow natural infiltration of rainwater into the ground. This high runoff scenario during rainfall events coupled to pollution emanating from the urban environment puts a high level of stress on the river system of Gauteng.

[Source: <https://armour.org.za/wp/about-us/armour-a-voice-for-water/>]

- 2.5.1 Define the concept *river management*. (1 x 2) (2)
- 2.5.2 Give evidence from the extract that shows the importance of catchment management in Gauteng. (2 x 1) (2)
- 2.5.3 Identify TWO issues from the article that pose a challenge to effective river management. (2 x 1) (2)
- 2.5.4 Explain why aquatic life is affected by poor river management in Gauteng. (1 x 2) (2)
- 2.5.5 In a paragraph of approximately EIGHT lines, provide sustainable strategies that can be implemented to deal with problems associated with poor river management systems. (4 x 2) (8)

(16)
[60]

TOTAL SECTION A: 120

SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

GENERAL INFORMATION ON MERRIVALE



Coordinates: 29°31'S; 30°14'E

Merrivale is a town in the Umgungundlovu District Municipality in KwaZulu-Natal. It is 145 km north-west of Durban and 5 km south-east of Howick.

Merrivale experiences warm wet summers and dry winter seasons. The temperatures between winter and summer range from 5 °C to 32 °C. The topography within the surroundings of Merrivale varies in elevation from 1 018 metres to 2 308,8 metres above sea level.

[Adapted from <https://en.wikipedia.org/wiki/Merrivale>]

The following English terms and their Afrikaans translations are shown on the topographic map:

ENGLISH

Diggings
Mooi River
Sewerage Works
Nature Reserve

AFRIKAANS

Delwery
Mooirivier
Rioolwerke
Natuurreservaat



3.1 MAP SKILLS AND CALCULATIONS

3.1.1 Study the information below. The orthophoto index map sheet west of 2930 CA 5 is ...

	2930 AC 24	2930 AC 25	2930 AD 21
29°30'	2930 CA 4	2930 CA 5	2930 CB 1
	2930 CA 9	2930 CA 10	2930 CB 6
			30°15'

- A 2930 CB 1.
- B 2930 CA 4.
- C 2930 CB 6.
- D 2930 CA 9.

(1 x 1) (1)

3.1.2 The scale of 1 : 50 000 shows a ... area and ... detail as it is a smaller scale than 1 : 10 000.

- (i) larger
- (ii) smaller
- (iii) less
- (iv) more

- A (i) and (iii)
- B (i) and (iv)
- C (ii) and (iii)
- D (ii) and (iv)

(1 x 1) (1)

Refer to the orthophoto map.

3.1.3 Calculate the straight-line distance in metres (m) that the power line covers from **6** in block **B3** to **7** in block **C5**.

Formula: **Actual Distance = Map distance x Map scale** (2 x 1) (2)

Refer to the topographic map.

- 3.1.4 Draw a freehand cross-section from the recreation facility at point **F** in block **D2** to point **G** in block **D3**. Indicate **F** and **G** on your cross-section. (2 x 1) (2)
- 3.1.5 Is the recreation facility at **F** in block **D2** intervisible from point **G** in block **D3**? (1 x 1) (1)
- 3.1.6 Calculate the magnetic declination for 2024. The difference in years is 6 years and the annual change is 9' westwards. (3 x 1) (3)

3.2 MAP INTERPRETATION

3.2.1 The wind that blows during the night in block **C2** on the orthophotomap is a/an ... wind.

- A anabatic
 B valley
 C katabatic
 D slope (1 x 1) (1)

Refer to block **D4** on the orthophoto map.

- 3.2.2 (a) Which time of the day (morning/afternoon) was the photograph taken? (1 x 1) (1)
- (b) Give a reason for your answer to QUESTION 3.2.2(a). (1 x 2) (2)
- 3.2.3 Give a climatological reason for the large number of perennial water sources (dams) and furrows found on the topographic map (1x2) (2)

Refer to river **H** in block **B1** on the topographic map.

- 3.2.4 (a) River **H** in block **B1** generally flows in a north-easterly direction. Give map evidence to support this statement. (1 x 1) (1)
- (b) Give evidence why the type of flow of river **H** is associated with laminar flow. (1 x 2) (2)
- 3.2.5 The drainage pattern **I** encircled in blocks **C3** and **D3** on the topographic map is ...

- A trellis.
 B dendritic.
 C radial.
 D rectangular. (1 x 1) (1)



- 3.2.6 Describe the underlying rock structure that is responsible for the drainage pattern (answer to QUESTION 3.2.5). (1 x 2) (2)

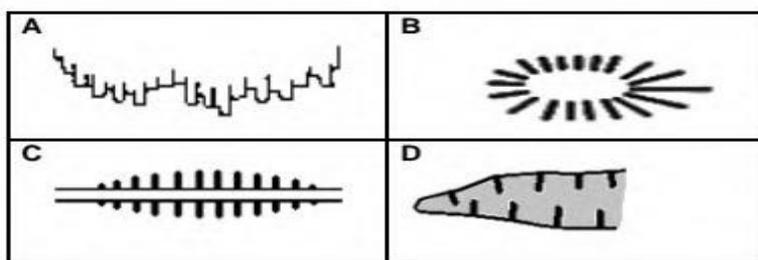
3.3 GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

Refer to the photograph below that shows an environmental issue in block **C2** on the topographic map.



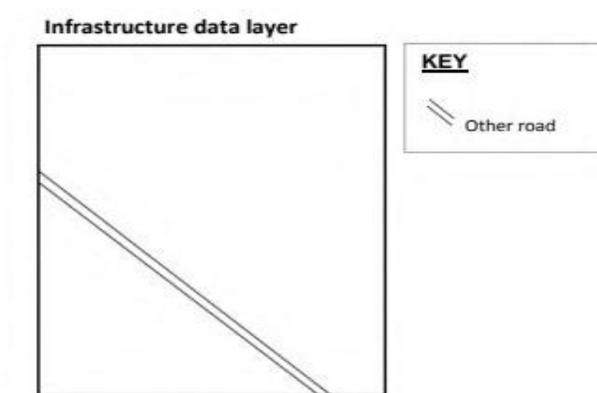
[Source : <https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=5574>]

- 3.3.1 Which symbol represents the environmental issue depicted in the photograph? (1 x 1) (1)



- 3.3.2 Classify the photograph as either primary or secondary data. (1 x 1) (1)
- 3.3.3 Give a reason for the high resolution of the photograph. (1 x 1) (1)
- 3.3.4 How would the high resolution of the photograph assist a GIS specialist to find a solution to the environmental issue depicted (answer to QUESTION 3.3.1)? (1 x 2) (2)

Refer to the sketch below of the infrastructure data layer in block **C3** on the orthophoto map.



- 3.3.5 Identify the missing infrastructure data layer, excluded (not indicated) on the sketch above. (1 x 1) (1)
- 3.3.6 Using the correct reference symbol, redraw the sketch and insert the infrastructure data layer identified in QUESTION 3.3.5. (2 x 1) (2)

TOTAL SECTION B: 30
GRAND TOTAL: 150