education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT

GRADE 12

GEOGRAPHY P1

JUNE 2024

MARKS: 150

TIME: 3 hours

This question paper consists of 18 pages

INSTRUCTIONS AND INFORMATION

1. This 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. Do NOT write in the margins of the ANSWER BOOK.

8. Draw fully labelled diagrams when instructed to do so.

9. Answer in FULL SENTENCES, except when you must state, name, identify or list.

10. Units of measurement MUST be indicated throughout your calculations, e.g. 1 020 hPa,14 °C and 45 m.

11. You may use a non-programmable calculator.

12. You may use a magnifying glass.

13. Write neatly and legibly.

SPECIFIC INSTRUCTIONS AND INFORMATION FOR SECTION B

14. A 1 **:** 50 000 topographic map 3325DC GQEBERHA and 3325 DC 23 orthophoto are provided.

15. The area demarcated in RED/BLACK on the topographic map represents the area covered by the orthophoto map.

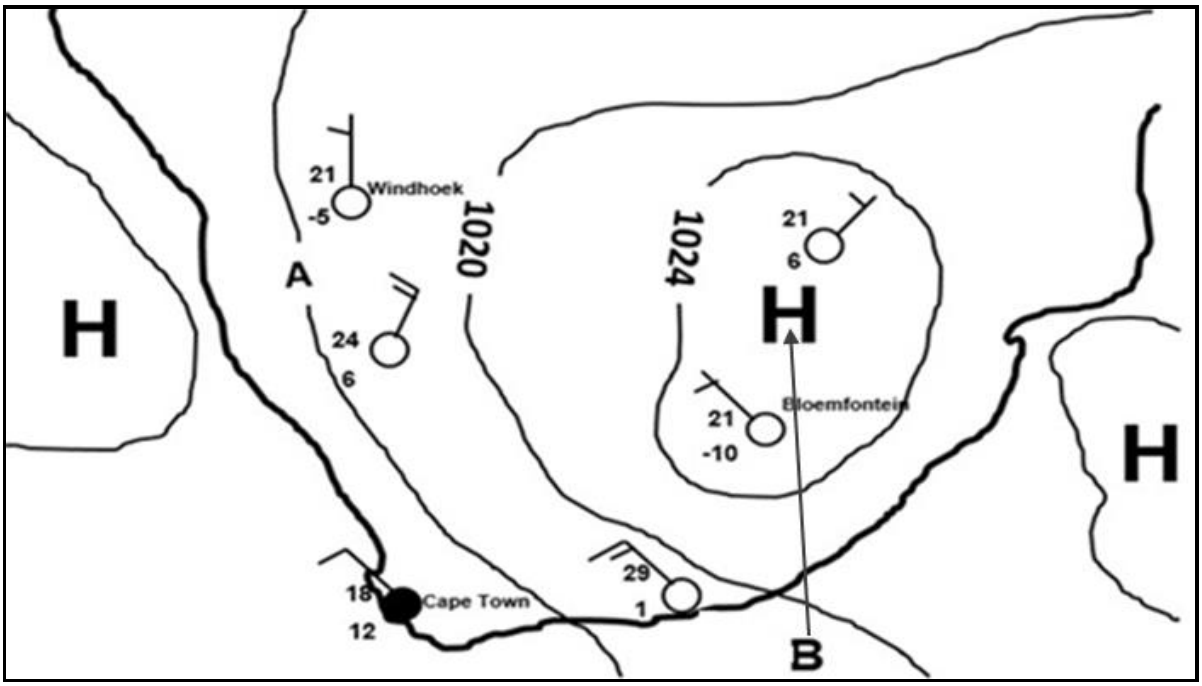
16. Show ALL Calculations. Marks will be allocated for steps in calculations.

17. You must hand in the topographic and orthophoto map to the invigilator at the end of this examination.

SECTION A: CLIMATE & WEATHER AND GEOMORPHOLOGY

QUESTION 1: CLIMATE AND WEATHER

1.1 Refer to sketch below showing a synoptic weather map. 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 numbers (1.1.1 to 1.1.8) in the ANSWER BOOK, e.g. 1.1.9 D.



[Source: weathersa.co.za]

1.1.1 The pressure cell labelled **B** in the above sketch is …

A Kalahari High Pressure.
B South Indian High Pressure.
C South Atlantic High Pressure.
D Coastal Low Pressure.

1.1.2 The season represented by the synoptic weather map is …

A summer.
B autumn.
C winter.
D spring.

1.1.3 Lines labelled **A** on the sketch is…

A contour line.
B isotherm.
C isobar.
D latitude.

1.1.4 The wind direction evident on Cape Town weather station model is …

A from Northwest to Southeast.
B from Southeast to Northwest.
C from Southwest to Northeast.
D from Northeast to Southwest.

1.1.5 Pressure labelled **B** will result into …

A stable weather conditions.
B unstable weather conditions.
C formation of clouds.
D rainy conditions.

1.1.6 Isobaric interval of synoptic weather map/chat in sketch above is … hPa.

A 2
B 4
C 6
D 8

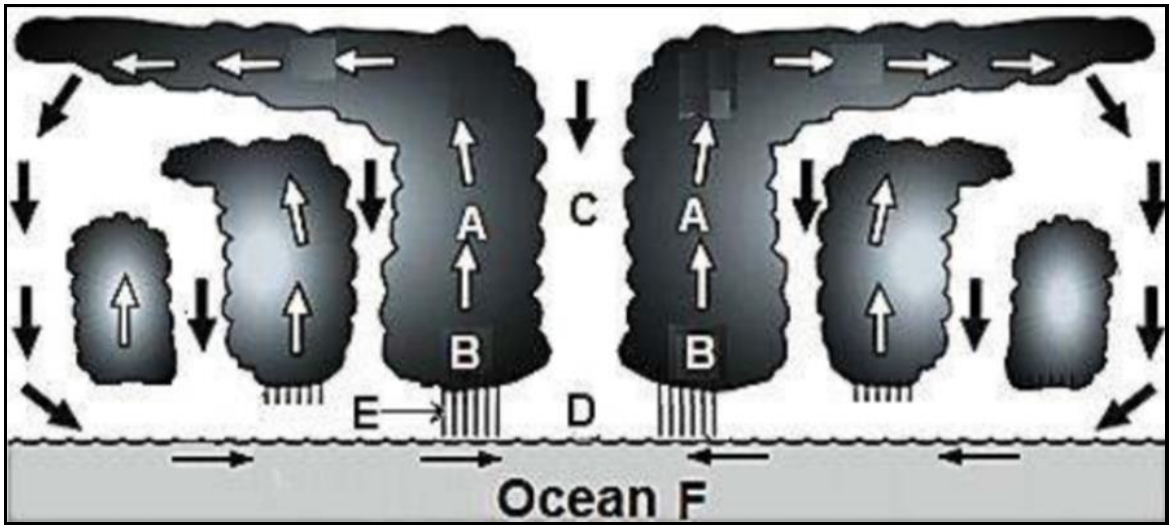
1.1.7 Wind speed at Bloemfontein weather station is … knots.

A 5
B 10
C 15
D 20

1.1.8 Outward curve or elongation of isobars away from a high-pressure cell is …

A ridge.
B trough.
C saddle.
D moisture front. (8 x 1) (8)

1.2 Refer to the sketch below showing a cross-section through a tropical cyclone in the Southern Hemisphere. Complete the statement in COLUMN A with the options in COLUMN B. Write only **Y** or **Z** next to the question numbers(1.2.1 to 1.2.7) in the ANSWER BOOK, e.g. 1.2.8 **Z**.

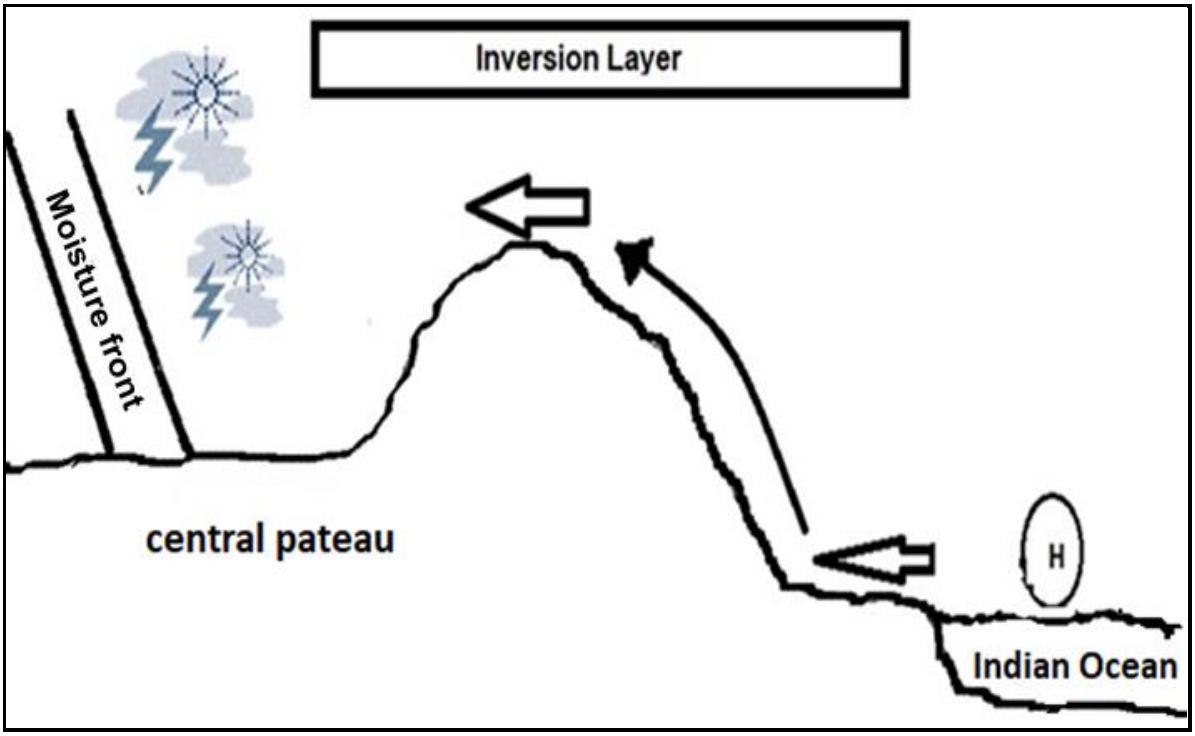


[Adapted from: studocu.com]

	COLUMN A		COLUMN B
1.2.1	Area labelled **C** is an ...	**Y** **Z**	eyewall eye
1.2.2	Cloud labelled **B** is ... cloud	**Y** **Z**	stratus cumulonimbus
1.2.3	The air at **D** is ...	**Y** **Z**	diverging converging
1.2.4	Precipitation type labelled **E** is ...	**Y** **Z**	snow heavy rainfall
1.2.5	Ocean labelled **F** is found between these latitudes …	**Y** **Z**	5º-30º 60º- 90º
1.2.6	Air circulation at **C** is …	**Y** **Z**	clockwise anticlockwise
1.2.7	Movement of weather system in figure 1.2 is …	**Y** **Z**	eastwards westwards

(7 x 1) (7)

1.3 Refer to sketch below showing line thunderstorms.



[Source: Examiner's own sketch]

1.3.1 Define the concept *moisture front.* (1 x 2) (2)

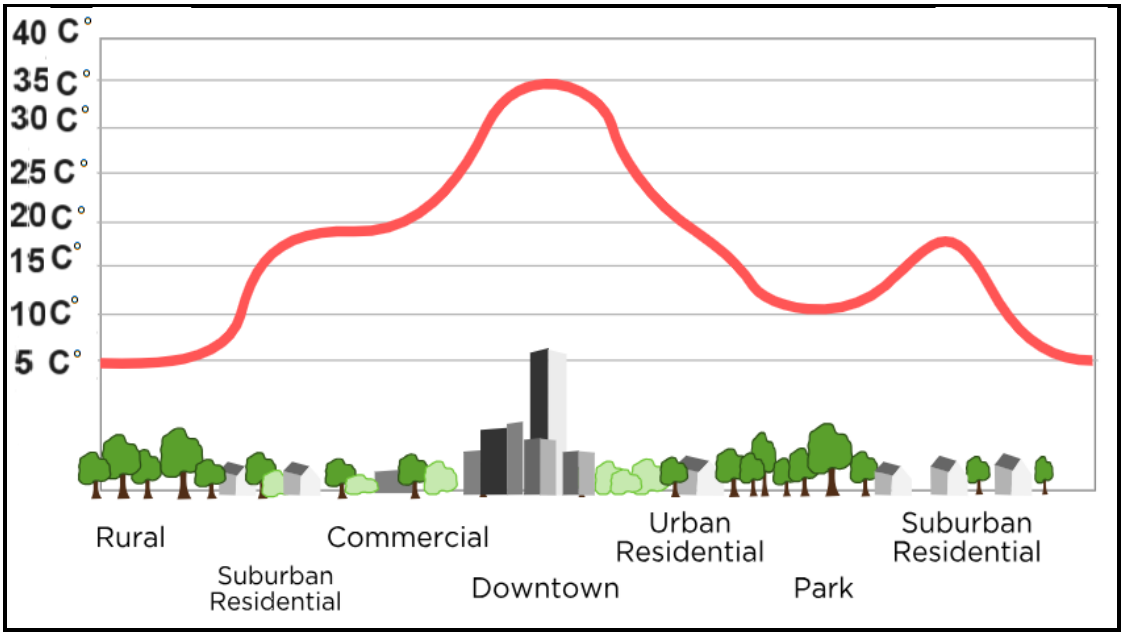
1.3.2 (a) Identify the Ocean current around Indian ocean. (1 x 1) (1)

(b) Explain the influence ocean current in QUESTION 1.3.2 (a) have on the air mass shown by arrows on the above sketch. (1 x 2) (2)

1.3.3 Describe the moisture content and density of air mass from Indian Ocean as shown with arrows in the sketch above. (2 x 2) (4)

1.3.4 With a paragraph of approximately SIX lines comment on why line thunderstorms generally occur in summer and not in winter. (3 x 2) (6)

1.4 Refer to the sketch below showing Urban Heat Island.



[Source: https://upload.wikimedia.org/wikipedia/commons/8/81/Urban_heat_island.svg]

1.4.1 Identify the highest temperature recorded on the sketch. (1 x 1) (1)

1.4.2 Explain why the urban areas are warmer than the surrounding areas. (1 x 2) (2)

1.4.3 Explain the impact of high-rise buildings on the high temperatures experienced in the CBD. (1 x 2) (2)

1.4.4 Distinguish between *Urban Heat Island* and *pollution dome*. (2 x 2) (4)

1.4.5 Discuss any THREE sustainable measures to put in place in order to reduce the urban heat island effects on South African cities. (3 x 2) (6)

1.5 Refer to extract on cold fronts.

Date: 10 June 2022

According to the South African Weather Service (SAWS), two cold fronts are expected to bring rain, strong winds, high waves and a significant drop in temperatures to South Africa.

The first cold front is expected to hit the Western Cape on Sunday evening 12 June. Ahead of this first cold front, strong north-westerly to westerly winds between 50–60 km/h, gusting up to 70–80 km/h, are expected over the southern parts of the Northern Cape and the interior of the Western and Eastern Cape from Sunday.

The second cold front is expected to reach the Western Cape by Monday evening 13 June, bringing continued high amounts of rainfall mainly to the south-western parts of the Western Cape, especially from Monday to Wednesday afternoon.

The wind direction associated with the cold front will change from north-west to south-west as the front moves over the Western Cape.

[Source: Adapted from http//www.First cold front to hit Western Cape this weekend – 'heav rainfall' to follow (thesouthafrican.com]

1.5.1 In which season do the cold fronts mentioned in the extract above influence the Western Cape? (1 x 1) (1)

1.5.2 Give evidence from the extract to support your answer to QUESTION 1.5.1. (1 x 1) (1)

1.5.3 Why do cold fronts have a greater impact on the Western Cape during this season (answer to QUESTION 1.5.1)? (1 x 2) (2)

1.5.4 The change in wind direction mentioned in the extract above is known as veering/backing in the Southern Hemisphere. (1 x 1) (1)

1.5.5 Give a reason from the extract for your answer in QUESTION 1.5.4. (1 x 2) (2)

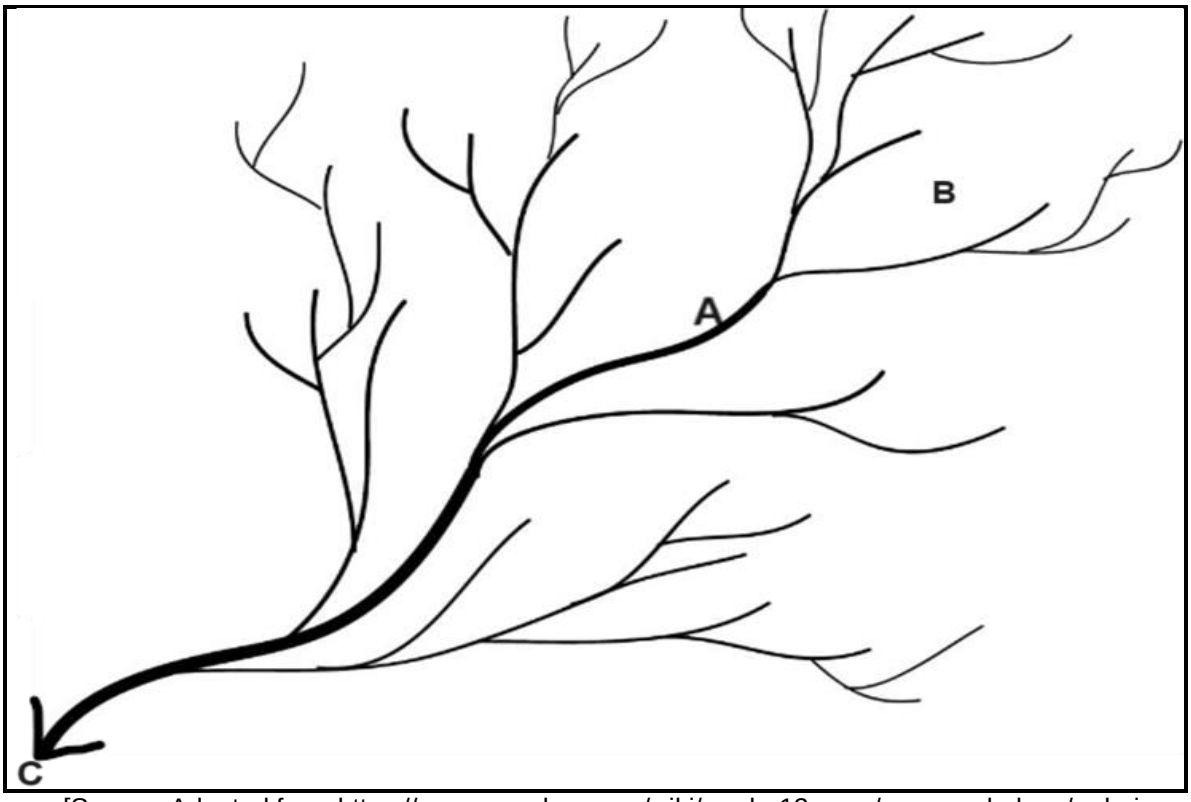
1.5.6 In a paragraph of approximately EIGHT lines, suggest positive and negative impacts of heavy rainfall associated with the cold fronts on the physical (natural) environment in the Western Cape. (4 x 2) (8)

[60]

QUESTION 2 GEOMORPHOLOGY

2.1. 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 numbers (2.1.1 to 2.1.8) in the ANSWER BOOK, e.g. 2.1.9 D.

Refer to the sketch below of the drainage basin to answer QUESTIONS 2.1.1 to 2.1.5.



[Source: Adapted from https://sageography.co.za/wiki/grade-12-caps/geomorphology/ drainage-systems-in-south-Africa/drainage-patterns/]

2.1.1 Dendritic patterns, which are by far the most common, develop in areas where …

A the rocks have a uniform/equal resistance to erosion.
B igneous rock that has many joints.
C the igneous rock has been affected by volcanic activity.
D the rock beneath the stream has no particular structure.

2.1.2 The stream order at **A** is … order.

A 1st
B 2nd
C 3rd
D 4th

2.1.3 The drainage density of the drainage basin is high because it is influenced by the river flowing in areas of … and …

(i) less vegetation
(ii) high porosity
(iii) high rainfall
(IV) high permeability

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

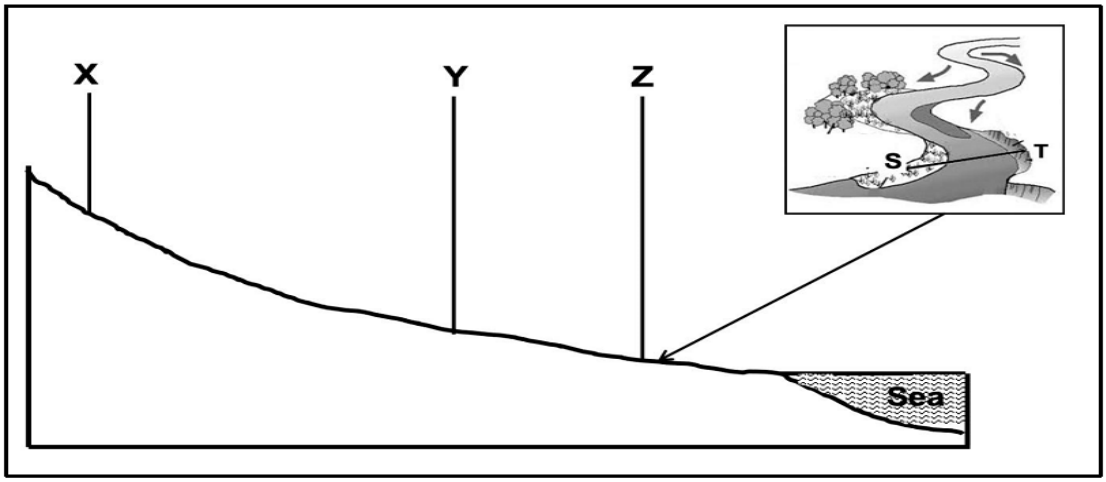
2.1.4 A point where two or more rivers meet is known as …

A catchment.
B drainage basin.
C river confluence.
D surface run-off.

2.1.5 The region of higher land between two rivers that are in the same drainage system is a/an …

A watershed.
B interfluve.
C water table
D source.

Refer to sketch below to answer question 2.1.6. to 2.1.8 Points **X**, **Y**, **Z** shows the different stages (courses) from the source to the mouth of a river and points **S – T** along the meander found at **Z**.



[Source: Examiner's own sketch]

2.1.6 The profile from the source to the mouth shows the …of the river.

A length
B volume
C width
D depth

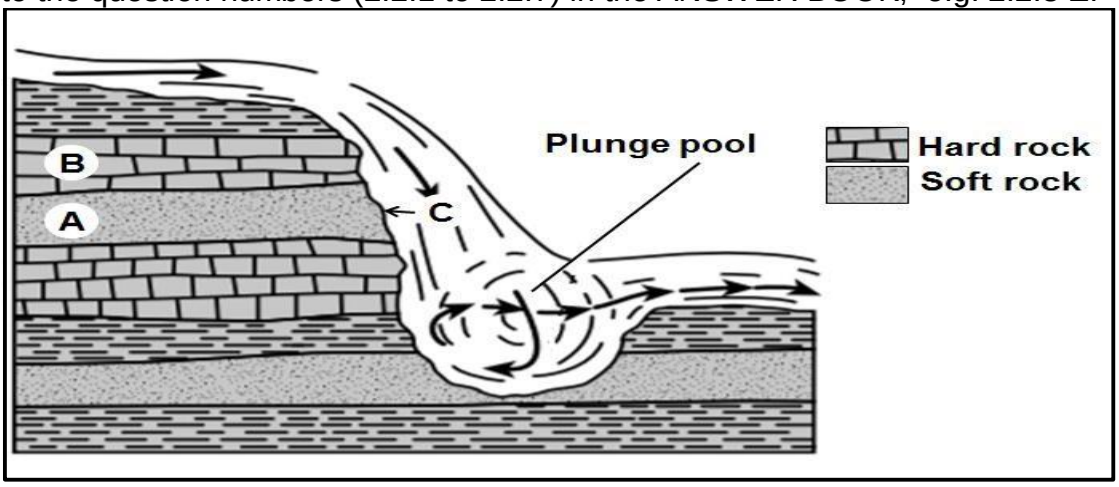
2.1.7 The stages (courses) represented by **X**, **Y** and **Z** are …

A upper, middle, lower.
B lower, middle, upper.
C middle, upper, lower.
C upper, lower, middle.

2.1.8 … describes the river valley at **X**.

A Narrow and deep
B Wide and shallow
C Narrow and shallow
D Wide and deep (8 x 1) (8)

2.2 Refer to the sketch below, which shows a waterfall with a plunge pool. Complete the statements in COLUMN A with the options in COLUMN B. Write only **X** or **Y** next to the question numbers (2.2.1 to 2.2.7) in the ANSWER BOOK, e.g. 2.2.8 **Z**.

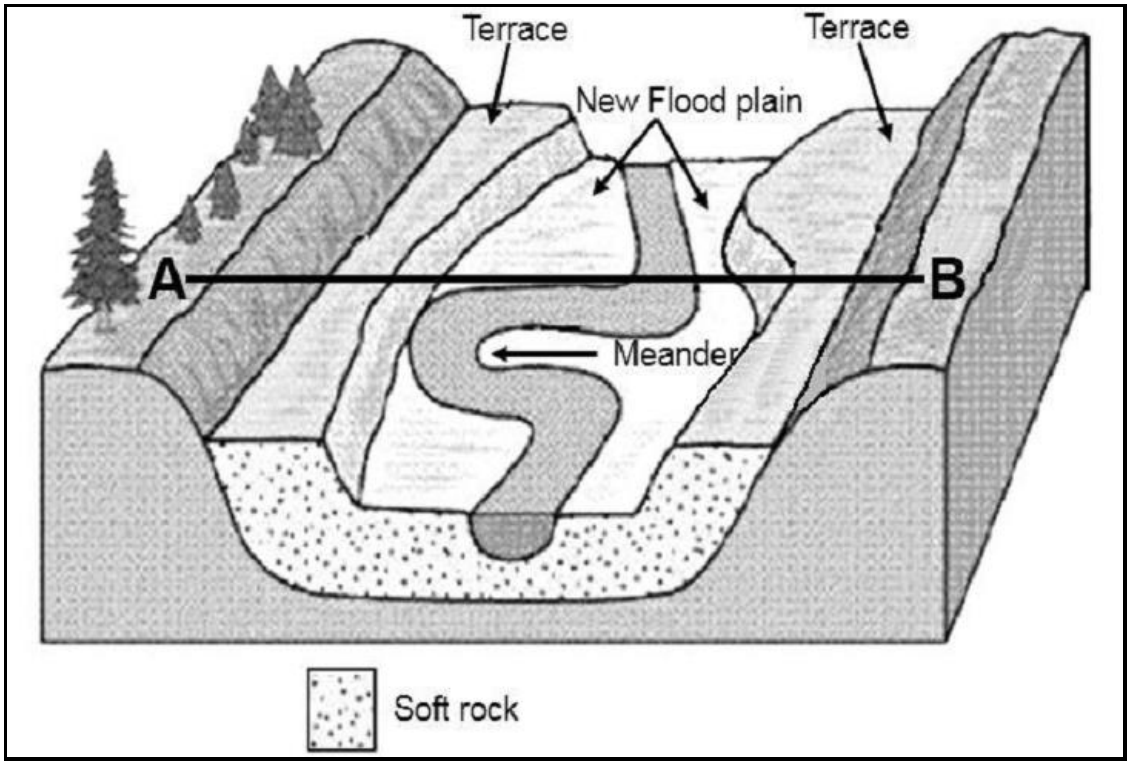


[Source: easyelimu.com]

COLUMN A	COLUMN B
2.2.1 Waterfalls are likely to be found in the …	**Y** upper course **Z** lower course
2.2.2 … refers to the softer rock that erodes faster.	**Y** Rock type **A** **Z** Rock type **B**
2.2.3 Waterfalls form when …	**Y** there are alternate layers of hard and soft rock. **Z** there are only soft rocks.
2.2.4 Plunge pool is formed by …	**Y** deposition **Z** erosion
2.2.5 The retreat of the waterfall will result in the formation of a …	**Y** gorge **Z** rapid
2.2.6 An advantage of waterfall is …	**Y** hydroelectricity. **Z** promoting water transport
2.2.7 When the softer rock at **C** erodes, it will cause …	**Y** the rock at **A** collapsed into a plunge pool**.** **Z** waterfalls to retreat downstream.

(7 x 1) (7)

2.3 Refer to the sketch below on river rejuvenation.



[Adapted from www.studyblue.com]

2.3.1 Define the term *river rejuvenation.* (1 x 2) (2)

2.3.2 Explain how river capture relate to river rejuvenation. (1 x 2) (2)

2.3.3 Draw a labelled free-hand cross section from **A** to **B** of the illustrated river rejuvenation above.

Marks will be allocated for:

(a) Shape of the rejuvenated valley (1 x 1) (1)

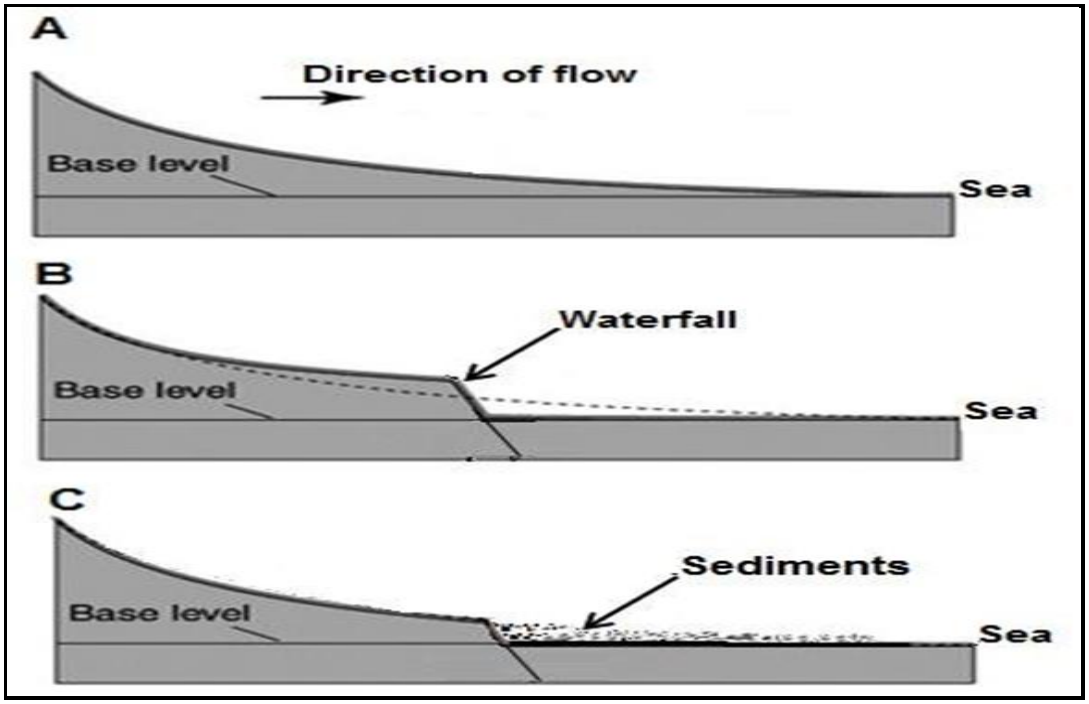
(b) Indicate the new flood plain (1 x 1) (1)

(c) Indicate the terraces (1 x 1) (1)

2.3.4 How did the river terraces (illustrated in the sketch above) form? (2 x 2) (4)

2.3.5 Explain how the illustrated landscape will negatively impact on infrastructure development. (2 x 2) (4)

2.4 The sketches **A, B** and **C** below are showing river profile and river grading.



[Adapted from: file://T:Fluvial%20Landforms]

2.4.1 Define the concept *longitudinal profile.* (1 x 2) (2)

2.4.2 State TWO characteristics of a longitudinal profile evident in sketch **A.** (2 x 1) (2)

2.4.3 Does sketch **A** represent a graded or an ungraded river? (1 x 1) (1)

2.4.4 Give a reason for your answer in QUESTION 2.4.3. (1 x 2) (2)

2.4.5 Identify a temporary and a permanent base level of erosion in sketch **B**. (2 x 1) (2)

2.4.6 Explain the processes that assisted the river in sketch **A** to have a steep gradient in the upper course and a gradual gradient in the lower course. (3 x 2) (6)

2.5 Refer to the picture and extract below on catchment and river management.

THE EFFECTS OF CHROME MINING ACTIVITIES ON THE WATER QUALITY OF HEX RIVER AND OLIFANTSNECK DAM

The Olifantsneck Dam is an arch type dam located on the Hex River near Rustenburg. The study was conducted to assess the water quality of Hex River downstream of Kroondal mine and effects of mining activities on the water quality. Potential pollutants were identified, quantified and their distribution was determined over seven years (2007-2013) along different sampling points upstream and downstream to the mine. Water quality-monitoring data was obtained from the mine.

The surface and underground water was sampled on a monthly basis and analysed by Aquatico, (a water quality service provider of Kroondal Chrome Mine) at SANAS Accredited Testing Laboratory. Mining activities in Rustenburg negatively impact the water resources owing to poor management of mining waste, for example slimes, waste rock and overabundant exposure of mine over burdens or waste rock materials that contains sulphide-rich materials and sediments which are generated throughout the mine's lifespan with the potential to generate Acid Mine Drainage (AMD).

[Adapted from: Mavunda A. N., May 2016]

2.5.1 Define the term *river management*. (1 x 2) (2)

2.5.2 According to the extract above, what is Aquatico. (1 x 1) (1)

2.5.3 Why are water testing laboratories important? (1 x 2) (2)

2.5.4 Describe the negative impact that mining activities have on Hex River. (1 x 2) (2)

2.5.5 In a paragraph of approximately EIGHT lines, explain strategies that could be implemented so that the Hex River becomes a sustainable source of water. (4 x 2) (8)

[60]

TOTAL SECTION A: 120

SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

GENERAL INFORMATION ON GQEBERHA (PORT ELIZABETH)

Coordinates : 33º 57'S; 25º 36'E

Ggeberha (Port Elizabeth) is a major seaport (harbour) and the densely populated city in the Eastern Cape in South Africa. It lies at Algoa Bay in the Indian Ocean.

The residential area is on a flat land, with an industrial sector at North End. Gqeberha is characterised by a large number of green belts.

The Coega Industrial Development Zone is located close to Gqeberha. It has a world class infrastructure which provides for the increased accessibility of services and industries to the rest of the world.

[Source: http://www.google.com/search?qPorthElizebeth]

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

ENGLISH	AFRIKAANS
Diggings	Uitgrawings
River	Rivier
Sewerage works	Rooilwerke
Estate	Landgoed
Salt pan	Soutpan
Nature reserve	Natuurreservaat

3.1 MAP SKILLS AND CALCULATIONS

3.1.1 Gqeberha is situated in … province

A North West
B Gauteng
C Eastern Cape
D Free State (1 x 1) (1)

3.1.2 The distance of a landing strip from **6** to **7** on an orthophoto is … metres

A 1 400
B 1 600
C 1 800
D 1 900 (1 x 1) (1)

3.1.3 Find the co-ordinates (grid reference) of the place of worship situated **Sidwell** in block **A3** on the topographical map.

(a) 33º 55' … S
(b) 25º … 46''E (2 x 1) (1)

3.1.4 Calculate the magnetic declination for 2024 following the given steps.

(a) Difference in years (1)
(b) Mean annual change (1)
(c) Total change (1)
(d) Magnetic declination for 2024 (2) (5)

3.1.5 What is the purpose of calculating magnetic declination? (1 x 1) (1)

3.2 **MAP INTERPRETATION**

Refer to the extended picture of Bakensriver and the topographical map.

[Adapted from en.m.wikipedia.org]

3.2.1 In which course/stage of a river is Bakensriver. (1 x 1) (1)

3.2.2 Substantiate your answer in Question 3.2.1 (1 x 2) (2)

3.2.3 Identify slope **A** and slope **B** from the above map of Bakensriver. (2 x 1) (2)

3.2.4 Will slope **A** be dominated by lateral erosion/deposition? (1 x 1) (1)

3.2.5 With a paragraph of approximately SIX lines, explain processes involved on the formation of slope **B**. (3 x 2) (6)

3.3 GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

Refer to Walmer Park in block **D1/D2** on the topographical map.

3.3.1	Define the term buffering.	(1 x 2)	(2)
3.3.2	Give evidence that buffering is taking place in block **D2**.	(1 x 1)	(1)
3.3.3	What is the purpose of buffering in this block?	(1 x 2)	(2)
3.3.4	Define the term data integration	(1 x 2)	(2)
3.3.5	Outline at least ONE type of data that has been utilised in making topographical map.	(1 x 1)	(1)

TOTAL SECTION B: 30

GRAND TOTAL: 150