GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

TYPE OF TASK: MID-YEAR EXAMINATION MARKING GUIDELINE

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SUBJECT	:	GEOGRAPHY
GRADE	:	11
TERM	:	2
TIME	:	3 HOURS
TOTAL	:	150 MARKS
DATE OF IMPLEMENTATION	:	06 JUNE 2023
TERM WEIGHTING	:	60%
SBA WEIGHTING	:	20%

This JUNE EXAMINATION consists of 17 pages

SECTION A: CLIMATE AND WEATHER AND GEOMORPHOLOGY

QUESTION 1: CLIMATE AND WEATHER

1.1 Refer to the FIGURE below showing two air pressure cells. Match the descriptions below with either Diagram **A** or Diagram **B**. Write only the question numbers (1.1.1 to 1.1.7) in the ANSWER BOOK, e.g. 1.1.8 B

DIAGRAM A

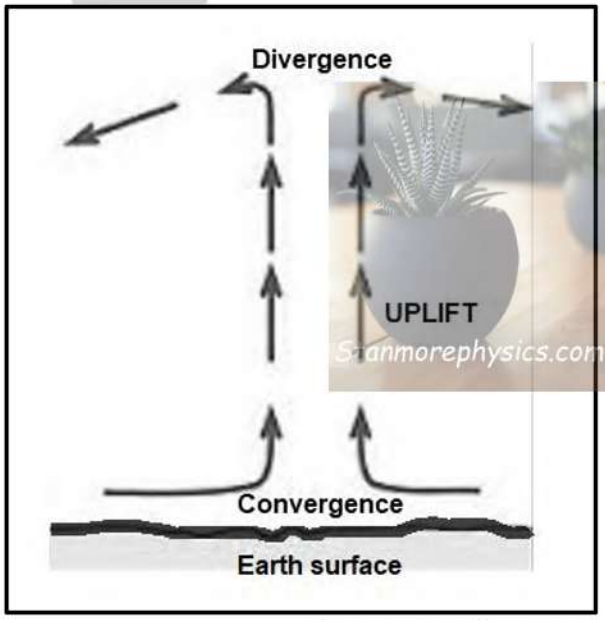
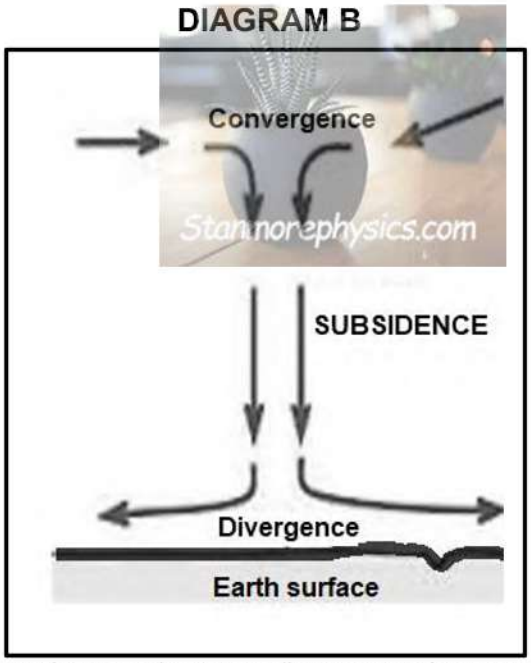


DIAGRAM B



[Source:https://www.shsu.edu/~dl_www/bkonline/131online/f04pressure/04index.htm]

1.1.1 This pressure cell is dominant over the interior of South Africa during winter.
B

1.1.2 The pressure cell is associated with stable conditions.
B

1.1.3 The pressure cell that is associated with clouds.
A

1.1.4 This pressure cell is associated with anticlockwise rotation of air in the Northern Hemisphere.
A

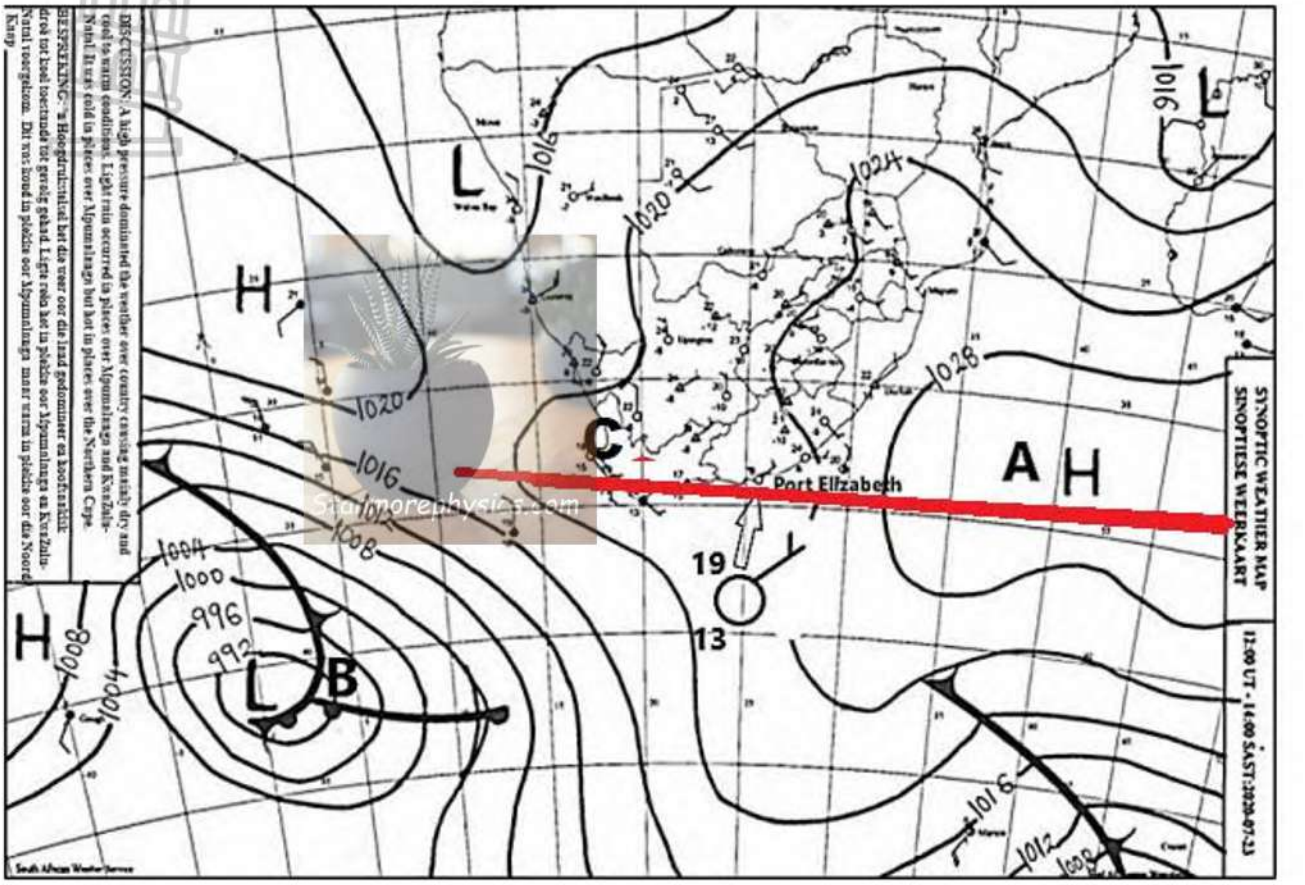
1.1.5 This pressure cell is associated with the Dry Adiabatic Lapse Rate (DALR.)
B

1.1.6 This pressure cell is associated with ridging.
B

1.1.7 This pressure cell is located closer to the Inter- Tropical Convergence Zone (ITCZ).
A

(7 x 1) (7)

1.2 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 (1.2.1–1.2.7) in the ANSWER BOOK, e.g. 1.2.8 A.



[Source: www.weathersa.co.za]

1.2.1 The term isobar is best described as …

A The line that joins places with the same rainfall
B The line that joins places with the equal temperature
C ***The line that joins places with the same air pressure above sea level***
D A line drawn on a topographic map to indicate ground elevation or depression

1.2.2 The isobaric interval on the synoptic weather map is …

A 2 hPa
B ***4 hPa***
C 6 hPa
D 8 hPa

1.2.3 The name of the high-pressure cell at **A** is the…

A South Atlantic Anticyclone
B Kalahari Anticyclone
C ***South Indian Anticyclone***
D Mid-Latitude Cyclone

1.2.4 Line **C** represents a…

A ***ridge***
B saddle
C trough
D isobaric interval

1.2.5 Weather phenomenon **B** is known as a …

A Coastal Low
B Tropical Cyclone
C Heat Low
D ***Mid-Latitude Cyclone***

1.2.6 The movement of air around weather phenomenon B is …

A Subsidence, convergence, clockwise rotation
B Uplift, divergence, anticlockwise rotation
C ***Uplift, convergence, clockwise rotation***
D Subsidence, divergence, anticlockwise rotation

1.2.7 The weather conditions at Port Elizabeth are …



[Source: www.weathersa.co.za]

(i) Temperature 13°C, Dew point temperature 19°C
(ii) Wind direction – NW, Wind direction – 5 knots
(iii) Low humidity, Clear sky, no precipitation
(iv) Temperature 19°C, Dew point temperature 13°C

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

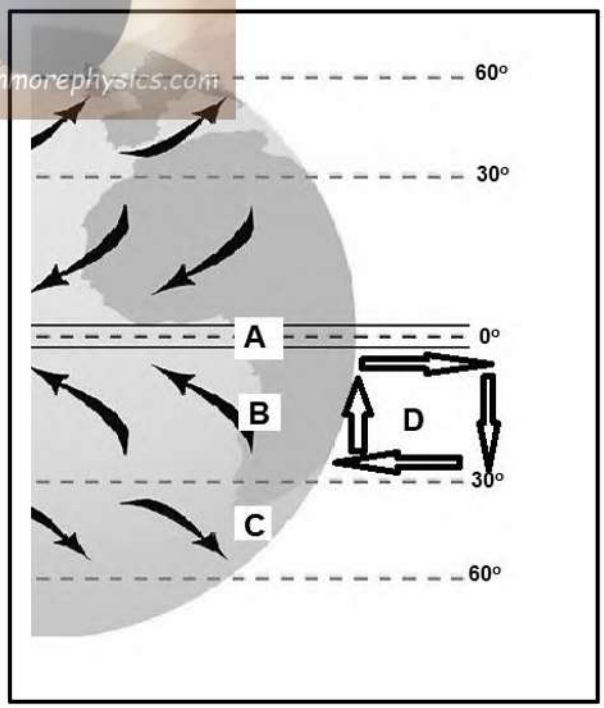
1.2.8 Study the isobars at **B** and describe the pressure gradient and wind speed

(i) Steep pressure gradient
(ii) Gentle pressure gradient
(iii) High wind speed
(iv) Low wind speed

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

(8 x 1) (8)

1.3 Refer to the sketch on the tri-cellular circulation



[Source:https://www.tutor2u.net/geography/reference/aqa-gcse-geography-weather-hazards-global-pressure-and-surface-winds]

1.3.1 The pressure belt at **A** is (high pressure / low pressure)? (1 x 1) (1)
Low pressure(1)

1.3.2 Give TWO reasons for your answer to QUESTION 1.3.1. (2 x 2) (4)
Air is converging on the surface(2)
Rising air(2)
Air is diverging in the upper air(2)

1.3.3 Name the winds marked **B** and **C** (2 x 1) (2)
B-Tropical Easterlies (trade winds) (1)
C-Westerlies/ Tropical westerlies(1)

1.3.4 Describe the movement of air in cell **D**. (1 x 2) (2)

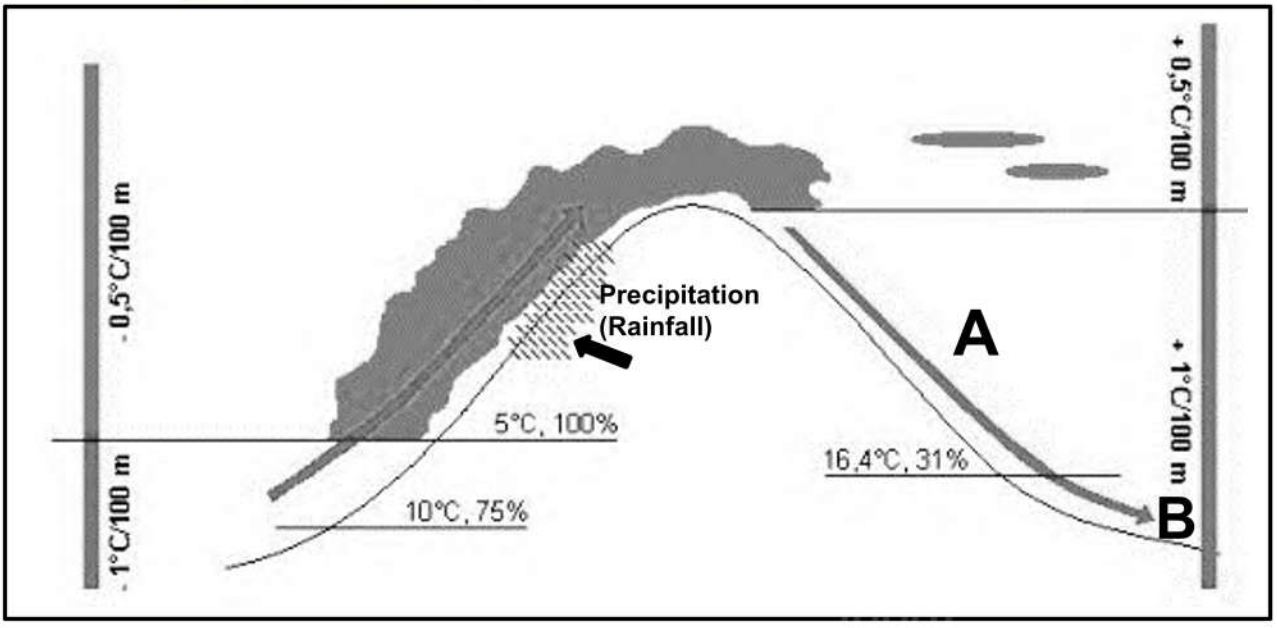
Warm air rises near the equator and flows back to the poles
Decends near the Sub tropical high pressure belt and flows back to the equator close to the earth's surface(2)

1.3.5 Explain the influence of the wind at **C** on the weather conditions in the Western Cape. (3 x 2) (6)

The westerlies blow between the sub-tropical HP and the Sub polar LP(2)
NW- winds in the SH(2)
Greater Coriolis force results in a change in direction to SW winds(2)
Blow at gale force speed(2)
Blow from warm to colder region and increase the temperature of the coastal areas(2)
With the migration of winds during winter, the Western Cape is under the influence of the Sub polar LP and SW-winds bring rain to the area(2)

[15]

1.4 Refer to the FIGURE below illustrating Föhn wind and answer the questions that follow.



[Source: https://sageography.co.za/wiki/grade-11-caps/grade-11-caps-climate-and-weather/2-global-air-circulation/6-winds-related-to-regional-and-local-air-movements-monsoons-and-fohn/]

1.4.1 Define the concept *Föhn wind*. (1 x 2) (2)

Warm and dry winds that descend on the leeward slope of the mountain (CONCEPT). (2)

1.4.2 Provide the name for a similar wind found in South Africa. (1 x 1) (1)

Berg Wind(1)

1.4.3 Account for the formation of precipitation (rainfall) on the windward side of the mountain. (2 x 2) (4)

On the leeward slope, warm air rises over a mountain range and cools down adiabatically(2). The air reaches dew point, condenses, and forms clouds which results in precipitation. (2)

1.4.4 Explain the characteristics of wind **B** that is descending on side **A** of the mountain. (2 x 2) (4)

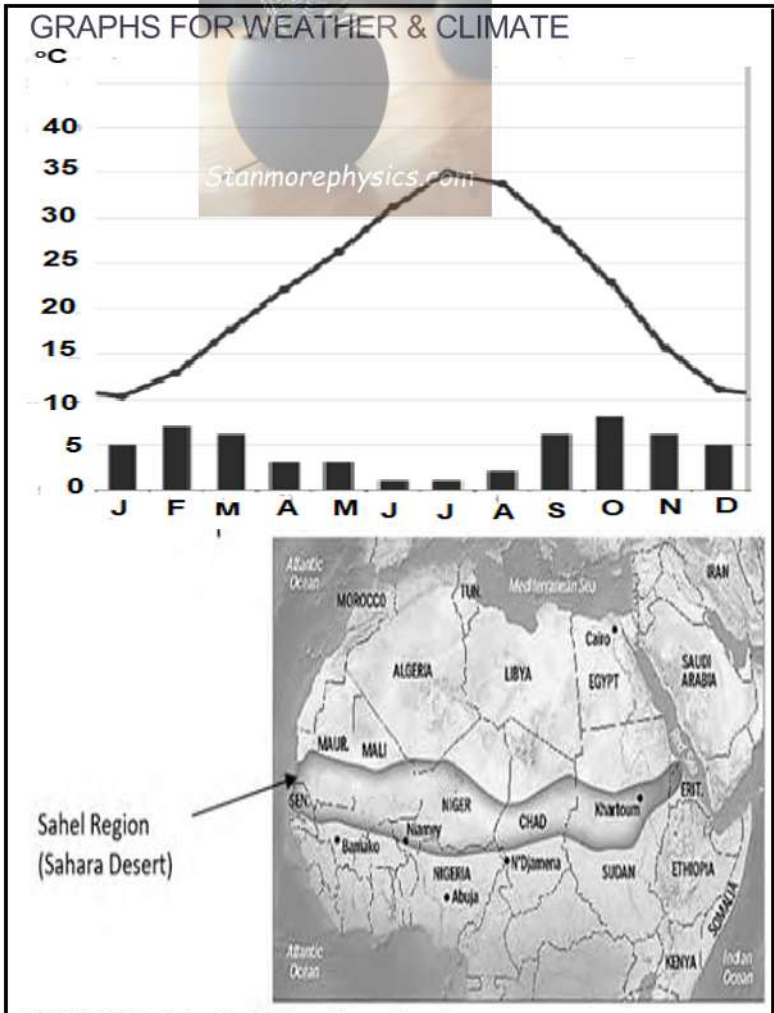
Wind D is warm and dry /air(2) is descending at DALR / temperature rises with 10 C for every 100m that the air is descending. (2)

1.4.5 Discuss the weather conditions that can be expected on side **A** of the mountain due to the influence of wind **B.** (2 x 2) (4)

People will experience warm dry weather / no rain(2) because of descending air(2) because of the friction evaporation will results In dry air/ warm dry conditions will clear when it starts to rain. (2)

[15]

1.5 Refer to the infographic on desertification.



[SOURCE: Adapted https://en.climate-data.org/africa/morocco/]

AFRICA'S AMBITIOUS GREEN BELT PROJECT

The 15 kilometre (9,3 mile) wide Great Green Wall project stretches over 7 775 km from Senegal on the Atlantic to Eritrea on the Red Sea. The aim was to curb the Sahara Desert's spread. But major challenges remain. The change in climate and weather patterns is triggering a rapid spread of the Sahara Desert, invading into lands and surrounding huge lakes, according to climate scientists. Seven countries of the Sahel region, an area located just south of the Sahara, therefore initiated a project that will see billions of trees planted across 11 countries by 2030, which will serve as buffer zones to stop the desertification

[SOURCE: from uit www.dw.com]

1.5.1 Define the term *desertification*? (1 x 2) (2)

The process where once fertile areas become arid. (2) [CONCEPT]

1.5.2 According to the infographic, what is the main aim of the Great Green Wall project? (1 x 1) (1)

'... to curb the Sahara deserts spread'(1)

1.5.3 According to the infographic, what is the main cause of the rapid spreading of the Sahara Desert. (1 x 1) (1)

' The change in climate and weather patterns ...' (1)

1.5.4 Calculate the temperature range (°C) between January and July. (1 x 1) (1)

= 35 – 10 = 25 °C(1)

1.5.5 Name TWO human activities that contribute to desertification. (2 x 1) (2)

Overgrazing(1)
Over cultivation (1)
Deforestation(1)
Subsistence farming(1)
Poor irrigation practices(1)
[ANY TWO]

1.5.6 In a paragraph of approximately EIGHT lines, discuss the positive impact that the Great Green Wall project will have on people living in this region. (4 x 2) (8)

It would restore millions of hectares of fertile lands (2)
This would decrease food insecurity / famine in the SAHEL (2)
There would be a reduction in land degradation (2)
It would help to reduce conflict in the area(2)
There would be jobs created / multiplier effect(2)
It would reduce mass migration from countries in the SAHEL to other parts of Africa(2)
It would reduce carbon dioxide and increase oxygen(2)

[ANY FOUR]

[15]

TOTAL QUESTION 1: 60

MARKING GUIDELINE

2.1

2.1.1 G (1)
2.1.2 H (1)
2.1.3 B (1)
2.1.4 C (1)
2.1.5 E (1)
2.1.6 D (1)
2.1.7 A (1)

(7 X 1) (7)

2.2

2.2.1 B (1)
2.2.2 F (1)
2.2.3 H (1)
2.2.4 D (1)

2.2.5 A (1)
2.2.6 E (1)
2.2.7 G (1)
2.2.8 C (1)

(8 X 1) (8)

2.3

2.3.1 Define the concept canyon.
A canyon is a deep, narrow valley with steep sides. (1 X 2) (2)

2.3.2 Identify the rock type in the FIGURE that the cap rock is made off.
Dolerite (1 X 1) (1)

2.3.3 Describe the characteristics of the plateau.
Flat and elevated above sea level (1 x 2) (2)
Uniform in their resistance to erosion resulting in flat plateau

2.3.4 Discuss how the plateau could be utilised by people.
Produce fertile soils rich in iron.
High rainfall and fertile soils produce good agricultural land.
(1 X 2) (2)

2.3.5 Distinguish between a mesa and a butte?
A mesa is a flat-topped hill with steep sides.
A butte is a flat-topped hill with steep sides and has a smaller area on top. (2 X 2) (4)

2.3.6 Describe the process in the formation of a butte.
Cap rock is reduced from the sides
Back-wasting occurs/ parallel retreat of slopes
Undercutting of softer shale under the dolerite
Slope erodes parallel to original slope,
Slope retains the height (2 X 2) (4)

2.4

2.4.1 Label slopes A and B.
A: crest
B: Cliff/ Free face (2 x 1) (2)

2.4.2 Explain why slope A has a thin covering of soil.
The soil/ weathered materials move downhill
The soil tends to be washed down the slope by the rain
(1 x 2) (2)

2.4.3 Why is slope B steep?
It is formed by a layer of hard or resistant rock
Too steep for the accumulation of weathered material
Angle of the cliff slope is about 90 degrees (1 x 2) (2)

2.4.4 a. Name the slope at C
Talus (1 x 1) (1)
b. Explain how slope C formed
It is formed of material eroded from the crest and free face.
(1 x 2) (2)

2.4.5 What impact would slope retreat have on slope element D?
The slope element D (pediment) would increase in length.
(1 x 2) (2)

2.4.6 Suggest why slope element D is suitable for the growth of vegetation.

It has mature soil
It has more soil accumulated from erosion of other slopes
It is gentle so water infiltrates
The gentle gradient enables people to use it for farming
(2 x 2) (4)

2.5

2.5.1 Identify the rock type responsible for the formation of the landforms in the FIGURE.
Batholith (1 x 1) (1)

2.5.2 Name the volcanic feature at **A**. ***Granite domes.*** (1 x 1) (1)

2.5.3 a. Is the feature at **A** intrusive or extrusive?
Intrusive (1 x 1) (1)

b. Give a reason for your answer for QUESTION 2.5.3 (a).

Intrusive rocks form from molten material (magma) that flows and solidifies underground, where magma cools slowly. Eventually, the overlying rocks are removed, exposing the granite. (1 x 2) (2)

2.5.4 Describe the characteristics of feature **B**.
Usually round and smooth when exposed.
Light in colour
Exposed domes are part of a much larger and deeper lying Batholith
(1 x 2) (2)

2.5.5 In a paragraph of approximately EIGHT lines explain the formation of feature **B**.
Development of tors begins when igneous rock cools down underneath the earth's surface.
Cracks form when granite cools down.
Groundwater seeps through the cracks and weathering takes place.
Groundwater also dissolves the minerals in the granite (chemical weathering).
More cracks form when weathering and erosion takes place.
The upper rock layer is removed, and the core stones of the earth's surface is revealed.
Core stones remain on the surface of the earth. (4 x 2) (8)

3.1 MAP SKILLS AND CALCULATIONS

3.1.1 Phalaborwa is located in the … province.

A Mpumalanga
B Northwest
C Gauteng
D Limpopo (1 x 1) (1)

3.1.2 23 on the index 2331 CC refers to…

A longitude.
B latitude.
C meridian.
D map code. (1 x 1) (1)

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3.1.3 Refer to the trigonometrical station in **Block E3** on the topographic map. Give the height of the trigonometrical station (1 x 1) (1)
532.2m(1)

3.1.4 Refer to the two spot heights at **7** in **Block B1** on the orthophoto map. Calculate the difference in height between the two spot heights. (2 x 1) (2)
451m - 448 m (1) = 3(1)

3.1.5 Calculate the horizontal distance between the TWO spot heights mentioned in QUESTION 3.1.4. (2 x 1) (2)
0.8 x 100m (1) = 80 (1) OR 0.9 x 100M = 90

3.1.6 Using the answers from QUESTIONS 3.1.4 and 3.1.5, calculate the average gradient between the two spot heights

Formula: Gradient = Difference in height / VI
Horizontal Distance HE (2 x 1) (2)

$$\frac{3}{80} = \frac{3}{3} : \frac{80}{3}$$ **(1) OR** $$\frac{3}{90} = \frac{3}{3} : \frac{90}{3}$$

$$= 1: 26.66 \quad OR \quad 1: 30 \quad (1)$$

3.1.7 Compare your answer to QUESTION 3.1.6 to a gradient of 1:22 and determine which on is steeper. (1 x 1) (1)
1:22 is steeper(1)

(10)

3.2 MAP INTERPRETATION

Refer to natural and constructed features in block **D2** on the topographic map.

3.2.1 (a) Constructed features are (created by nature / created by humans).

Created by humans(1) (1)

(b) Identify ONE constructed feature found in block **D2** on the topographic map. (1 x 1) (1)
Reservoir(1) buildings(1) sewage works(1) roads(1) power lines(1) tracks and hiking trail(1) bench mark(1) ANY ONE

(c) Explain the use/importance of the constructed feature identified in QUESTION 3.2.1 (b). (1 x 2) (2)
Reservoir store water(2)
buildings for shelter (2)
sewage works for water purification (2)
roads for transportation(2)
power lines for electricity (2)
tracks and hiking trail used when hiking / helps one to find the way around a place.(2)
bench mark for indication of height (2)
ANY ONE

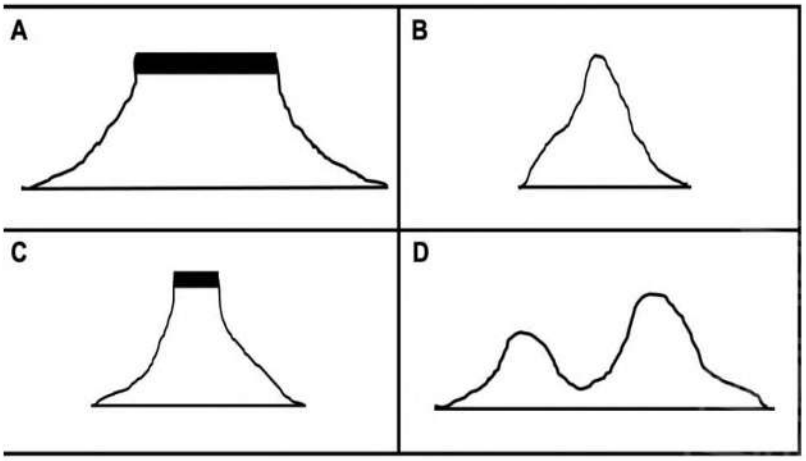
Refer to block **E4** on the topographic map

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3.2.2 (a) Is there intervisibility between spot heights **499** and **491** in block **E4.** (1 x 1) (1)
Yes, there is intervisibility(1)

(b) Give a reason for the answer to QUESTION 3.2.2 (a). (1 x 2) (2)
There is no obscuring feature(2) no high lying area/mountain bet ween the spot heights(2)

3.2.3 Match landform **8** in block **C1** on the orthophoto map with the correct freehand cross-section. below (1 x 1) (1)



3.2.4 The landform at QUESTION 3.2.3 is formed from …

A inclined
B vertical
C horizontal
D tilted (1 x 1) (1)

3.2.5 (a) Give the name of landform **8** in **Block C1** on the orthophoto map. (1 x 1) (1)

Conical hill(1)

(b) Give ONE use of the landform mentioned in QUESTION 3.2.5 (a). (1 x 1) (1)

Tourist attraction(1)

3.2.6 Give ONE tourist attractions located in the Phalaborwa region. (1 x 1) (1)

Blyde River Canyon / the Three Rondavels(2) God's Window(2) Bourke's Luck Potholes and river cruises on the Olifants River(2)



3.3 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

3.3.1 ***"Orthophoto images have become one of the most preferred remote sensing methods"***

(a) Define the term *remote sensing*. (1 x 2) (1)

Collecting information of an object without physically touching that object(2) Concept

(b) Identify TWO types of technologies that can be used by GIS specialists to capture images during remote sensing. (2 x 1) (2)

Helicopters(1)
Airplanes(1)
Drones(1)
Satellite(1) **ANY TWO**

Refer to **Block C3** on the orthophoto map and choose the correct answer for QUESTIONS 3.3.2 (a) and QUESTION 3.3.2 (b).

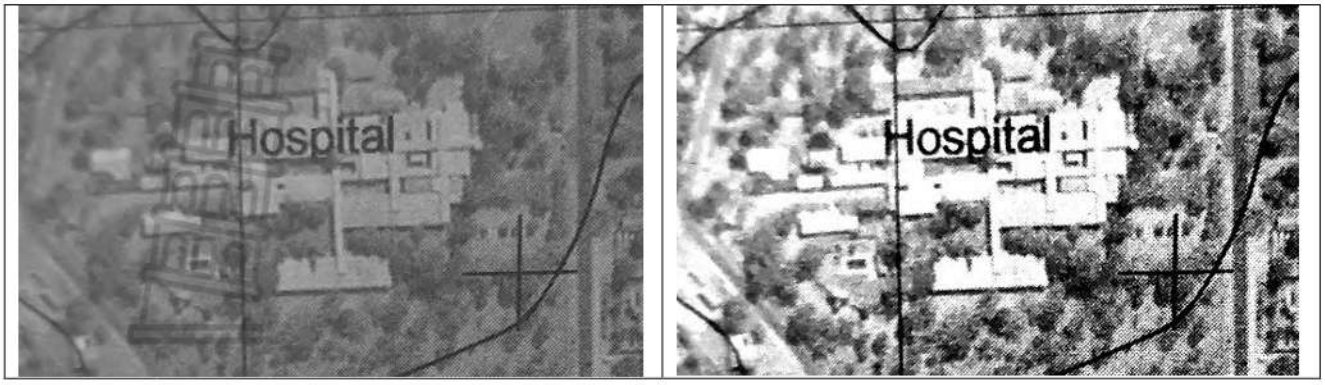
3.3.2 (a) The hospital is an example of a (point, line or polygon) feature. (1 x 1) (1)

Point(1)

(b) The location of the hospital is representing (spatial/attribute) data. (1 x1) (1)

Spatial(1)

Refer to feature **A** and **B** below



(c) Between feature **A** and **B** which one represents a high resolution? (1 x 1) (1)

B(1)

(d) Give a reason for your answer for QUESTION 3.3.2.(c) (1 x 2) (2)

The image is more clear(2) (concept) **[8]**

TOTAL SECTION B: [30]

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