



**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

NOVEMBER 2022

GEOGRAPHY P1

MARKS: 150

TIME: 3 hours

Stanmorephysics

This question paper consists of 15 pages.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of TWO SECTIONS.

SECTION A:
QUESTION 1: The Atmosphere (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 subsections of questions answered.
5. Start EACH question at the top of a NEW page.
6. Number the questions 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 have to state, name, identify or list.
10. Units of measurement MUST be indicated in your final answer, for example 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

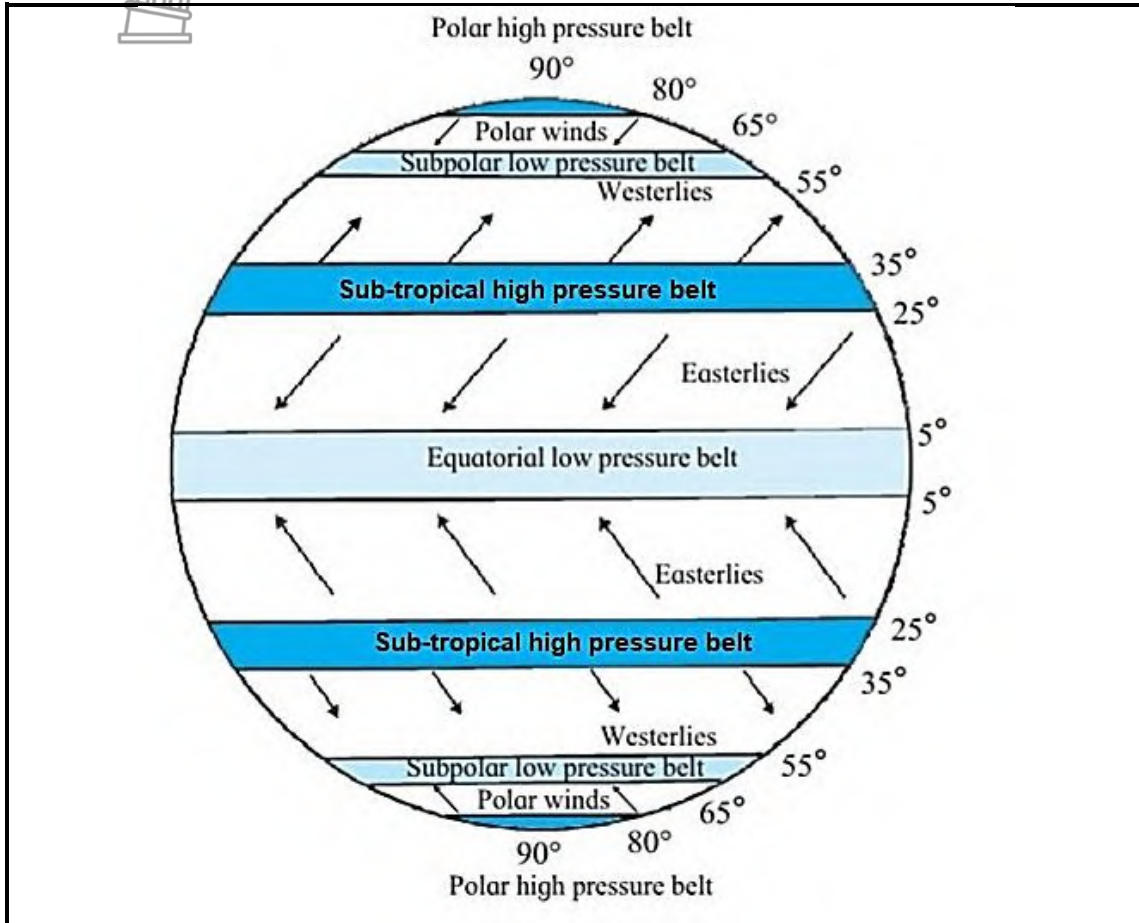
14. A 1 : 50 000 topographical map (3025AD PHILIPPOLIS) and an orthophoto map of a part of the mapped area are provided.
15. The area demarcated in RED/BLACK on the topographic map represents the area covered by the orthophoto map.
16. Show ALL calculations. Marks will be allocated for this.
17. You must hand in the topographic and the orthophoto map to the invigilator at the end of this examination session.



SECTION A: CLIMATE AND WEATHER AND GEOMORPHOLOGY

QUESTION 1: THE ATMOSPHERE

1.1 The FIGURE shows global air circulation. Match the descriptions below with a term/concept from the diagram. You may use a term/concept more than once. Write only the term/concept next to question numbers (1.1.1 to 1.1.7) in the ANSWER BOOK, for example 1.1.8 polar belt.

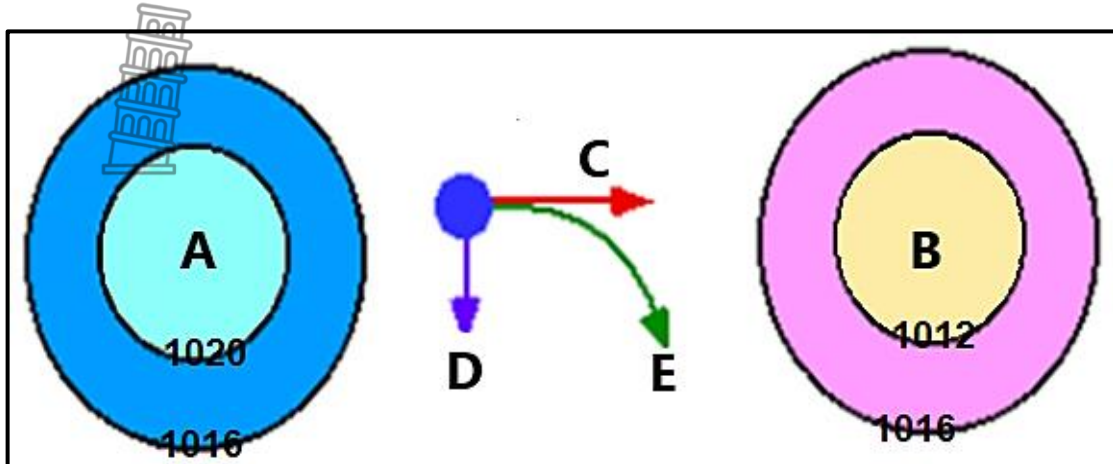


[Source: studyhash.com]

- 1.1.1 The Ferrel Cell is associated with these winds
- 1.1.2 ITCZ is associated with this belt of pressure
- 1.1.3 Very cold winds
- 1.1.4 The Hadley Cell is associated with these winds
- 1.1.5 Very low temperatures in this pressure belt results in snow
- 1.1.6 This pressure belt is located between 25°–35°
- 1.1.7 Winds converge at this pressure belt resulting in thunderstorms

(7 x 1) (7)

- 1.2 Refer to the FIGURE that shows the relationship between pressure gradient and Coriolis force. Choose the correct word(s)/letter(s) from those given in brackets which will make each statement geographically CORRECT. Write only the word(s)/letter(s) next to the question numbers (1.2.1 to 1.2.8) in the ANSWER BOOK.



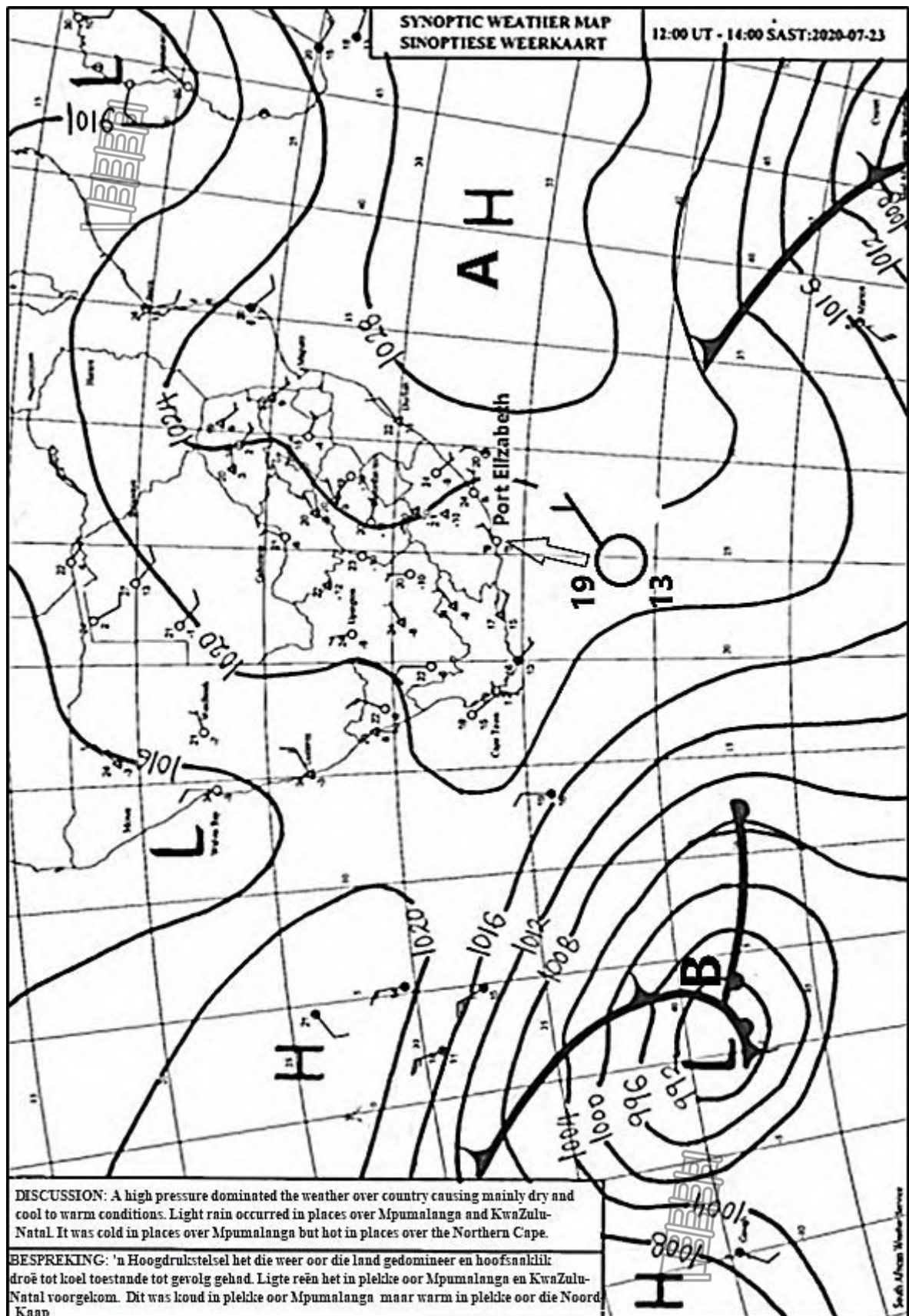
[Source: wwzoloatmos.vicc.edu]

- 1.2.1 Winds blow flow from (A to B/B to A).
- 1.2.2 (Coriolis/Pressure gradient) force determines the speed at which air moves.
- 1.2.3 A (coriolis/pressure gradient) force causes winds to deflect or change direction.
- 1.2.4 In the northern hemisphere winds deflect to the (left/right).
- 1.2.5 Subsidence is associated with a (high/low) pressure.
- 1.2.6 A (geostrophic/berg) wind blows when the pressure gradient and the Coriolis force is equal in strength.
- 1.2.7 Convergence is associated with a (low/high) pressure.
- 1.2.8 The pressure gradient is (steep/gentle) when isobars are far apart.

(8 x 1) (8)



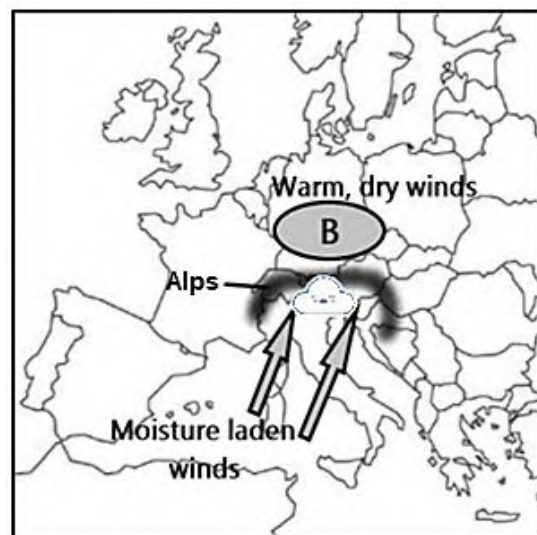
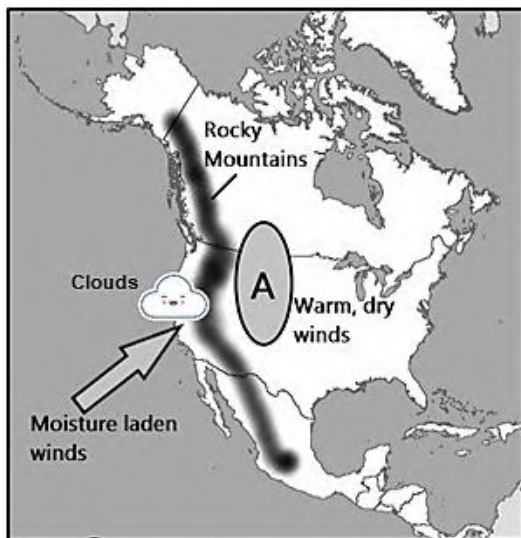
1.3 Refer to the FIGURE showing a synoptic weather map of Southern Africa.



[Source: www.weathersa.co.za]

- 1.3.1 Give evidence that the synoptic weather map represents winter conditions. (1 x 1) (1)
- 1.3.2 Determine the isobaric interval on the synoptic weather map. (1 x 1) (1)
- 1.3.3 Give the weather conditions of the weather station at Port Elizabeth. (4 x 1) (4)
- 1.3.4 Name the high-pressure cell at **A**. (1 x 1) (1)
- 1.3.5 How will the position of **A** decrease the rainfall over the eastern part of the country? (2 x 2) (4)
- 1.3.6 Explain how the warm and cold ocean currents on the eastern and western side of South Africa would control the temperature of South Africa in winter. (2 x 2) (4)

1.4 Study the FIGURE based on a diagram showing warm, dry winds that blow over the North American and European continents.



[Source: Examiner]

- 1.4.1 Provide the local names of the warm, dry winds indicated by **A** and **B** on the different continents. (2 x 1) (2)
- 1.4.2 Is the wet adiabatic lapse rate found on the windward or leeward side? (1 x 1) (1)
- 1.4.3 Why is the wind dry at **A** and **B** on the maps? (2 x 2) (4)
- 1.4.4 In a paragraph of approximately EIGHT lines, explain the influence that these warm, dry winds have on economic activities in the areas indicated on the different maps. (4 x 2) (8)

- 1.5 Below is an extract on the effects of desertification in the Sahel Region.

THE EFFECTS OF DESERTIFICATION IN AFRICA

Desertification is a process that destroys fertile land. This can be caused by drought, overpopulation, over-farming, deforestation and climate change. The most vulnerable region is a 3 000-mile stretch of land that includes ten countries in the Sahel region of Africa. The Sahel is the area between the Sahara Desert and the Sudanian Savannah. This region is under constant stress due to frequent droughts and soil erosion. A dense forest can become a field of dust in a matter of years, making mass migrations inevitable. Africans frequently migrate south in search of fertile land.

Agriculture in Africa tends to result in low productivity, as most of the land is characterised as a semi-desert. Clearing the land of trees also reduces the structure of the soil. Coupled with wind erosion, the topsoil blows away and leaves a desert-like land.

The country that is arguably the most damaged by desertification is Senegal. Migrations in Senegal are common, as wind erosion, deforestation and climate change wreaks havoc on farms and livestock. Those most affected by desertification in Senegal move to Gabon, a country in West Africa, or even to Europe or South America. More than half of Senegalese work in agriculture, and desertification forces those with meagre profits to move elsewhere to escape poverty.

[Source: borgenprojects.org/desertification-in-africa]

- 1.5.1 According to the extract, state ONE human cause of desertification. (1 x 1) (1)
- 1.5.2 Name the region most vulnerable to desertification in Africa. (1 x 1) (1)
- 1.5.3 Why is fertile soil so important to the people of Africa? (1 x 1) (1)
- 1.5.4 What social impact would a lack of fertile soil have on the people of Africa? (2 x 2) (4)
- 1.5.5 How does desertification in Senegal have a negative economic impact on other countries in Africa? (2 x 2) (4)
- 1.5.6 Suggest TWO management strategies that could be implemented to combat (reduce) the spread of desertification. (2 x 2) (4)

[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 2.1.7) in the ANSWER BOOK, for example 2.1.8 A.

2.1.1 Table Mountain is an example of a ...



- A canyon.
- B hogsback.
- C butte.
- D mesa.

2.1.2 ... are the largest of all intrusive forms.

- A Lopoliths
- B Batholiths
- C Laccoliths
- D Domes

2.1.3 A ... is a horizontal intrusion of igneous rock that forms a sheet.

- A sill
- B pipe
- C volcano
- D dyke

2.1.4 An asymmetrical ridge with a steep dip slope of more than 45° is a ...

- A canyon.
- B hogsback.
- C butte.
- D mesa.

2.1.5 A ... is a vertical intrusion of igneous rock.

- A dyke
- B pipe
- C volcano
- D sill

2.1.6 The extensive flat surface of a Karoo landscape is called a ...

- A knickpoint.
- B pediment.
- C pediplain.
- D peneplain.

2.1.7 ... form when rivers incise into joints in rocks.

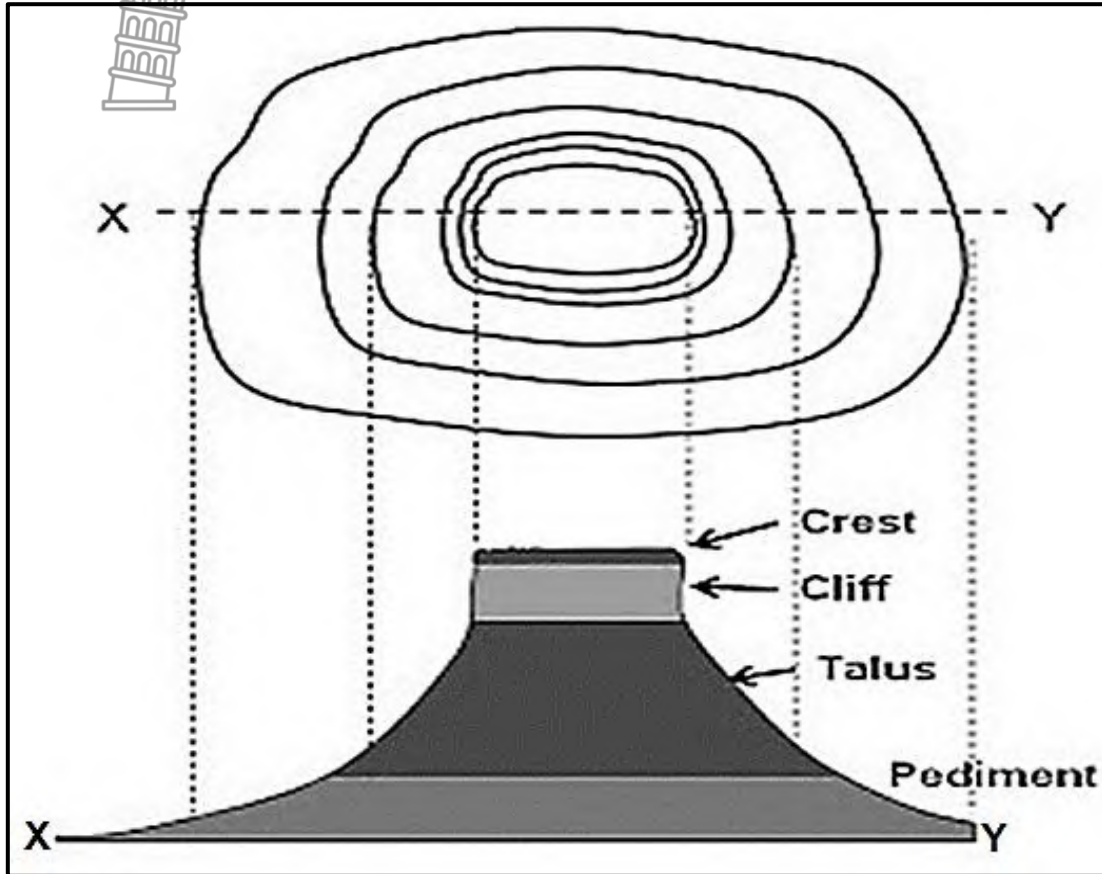


- A Canyons
- B Domes
- C Mountains
- D Hills

(7 x 1) (7)

2.2 Refer to FIGURE 2.2 that shows slope elements. Write only the slope element that matches the description next to the question numbers (2.2.1 to 2.2.8) in the ANSWER BOOK, for example, 2.2.9 cliff. You can choose a slope element more than once.

FIGURE 2.2: SLOPE ELEMENTS



[Source: easymapwork.blogspot.com]

- 2.2.1 Ideal for farming because of a gentle slope
- 2.2.2 Steep vertical slope formed by resistant rock
- 2.2.3 Constant slope where deposition occurs
- 2.2.4 Convex in shape and found at the top of a hill/mountain
- 2.2.5 Flat slope with an angle of 1° to 7°
- 2.2.6 The angle of this slope element is usually greater than 80°
- 2.2.7 A sharp break in angle in this slope element causes the knickpoint to form
- 2.2.8 Weathering occurs on this slope under the force of gravity (8 x 1) (8)

2.3 Refer to the photograph showing the Drakensberg Mountain as an example of a basaltic plateau.

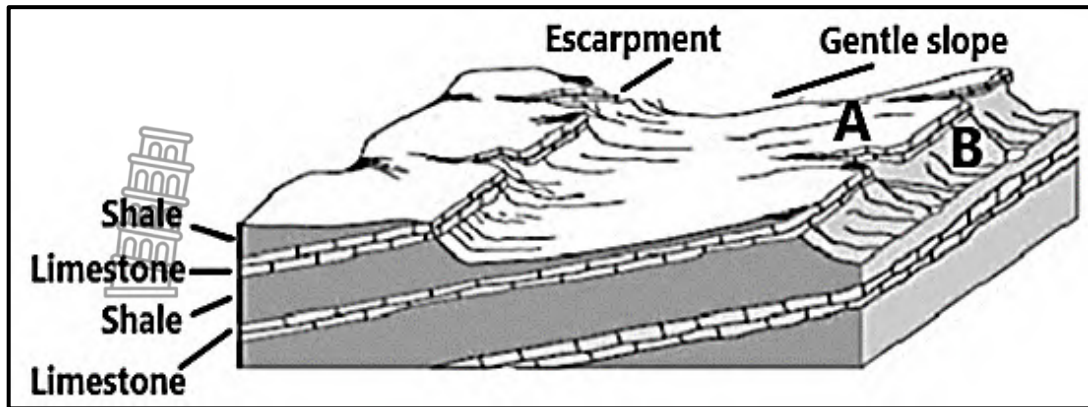


[Source: www.bing.com]

- 2.3.1 Name the type of topography associated with a basaltic plateau. (1 x 1) (1)
- 2.3.2 What evidence on the photograph indicates that the basaltic plateau rocks are uniform in resistance to erosion? (1 x 2) (2)
- 2.3.3 Why are the slopes of the basaltic plateau rugged (uneven)? (1 x 2) (2)
- 2.3.4 How do basaltic plateaus form? (2 x 2) (4)
- 2.3.5 What physical (natural) impact does the Drakensberg basaltic plateau have on human activity? (3 x 2) (6)



2.4 Refer to the FIGURE showing a cuesta.



[Source: www.bing.com]

- 2.4.1 Name a type of sedimentary rock depicted in the sketch. (1 x 1) (1)
- 2.4.2 What evidence in the sketch indicates that this is a cuesta? (2 x 1) (2)
- 2.4.3 Identify the slopes at **A** and **B**. (2 x 1) (2)
- 2.4.4 Why will the slope at **B** be steeper than the slope at **A**? (1 x 2) (2)
- 2.4.5 How will a cuesta dome form? (2 x 2) (4)
- 2.4.6 Explain how cuestas are of benefit for human activities. (2 x 2) (4)



2.5 Study the FIGURE which illustrates tors.



[Source: researchgate.net]

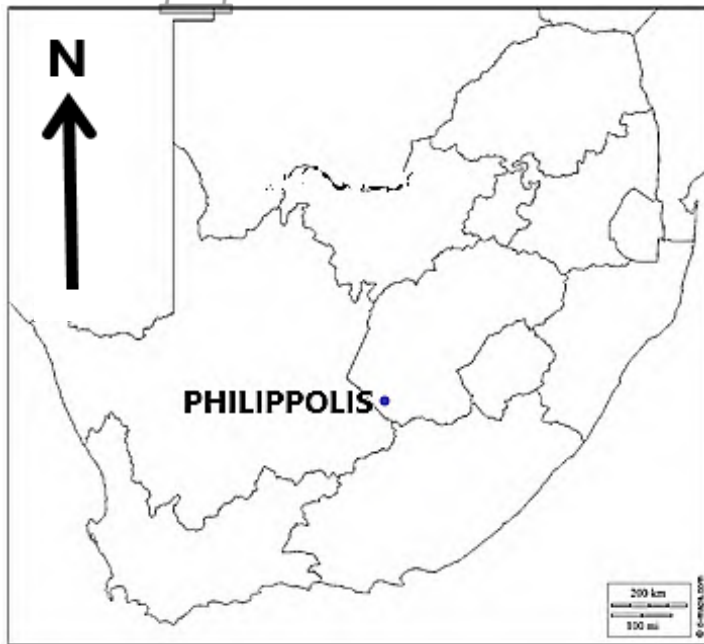
- 2.5.1 Name ONE igneous intrusion that tors can originate from. (1 x 1) (1)
- 2.5.2 What are the rocks at **A** known as during the process of tor formation? (1 x 1) (1)
- 2.5.3 Name the type of igneous rock that **A** consists of. (1 x 1) (1)
- 2.5.4 How did weathering in the vertical and horizontal joints of igneous rocks determine the shape of the rocks at **A**? (2 x 2) (4)
- 2.5.5 In a paragraph of approximately EIGHT lines, explain how tors develop. (4 x 2) (8)

[60]



SECTION B**QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES**

The questions below are based on the 1 : 50 000 topographical map 3025AD PHILIPPOLIS, as well as the orthophoto map of a part of the mapped area.

GENERAL INFORMATION ON PHILIPPOLIS

Philippolis is a small town situated in the Motheo and Xhariep region of the Free State Province in South Africa. In 1823 it served as a missionary outpost for the Bushman. This makes Philippolis the oldest settlement in the Free State Province.

Seventy-five of Philippolis's buildings have been declared as national monuments.

Philippolis's climate is characterised by warm to hot summers and cool to cold winters. This semi-desert area also brings fluctuations of temperature from day to night with an average amount of annual precipitation of 353,0 mm.

Coordinates: 30° 15' S 25° 16' E

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

ENGLISH

Diggings
Furrow
Sewerage works

AFRIKAANS

Delwery/Uitgrawings
Voor
Rioolwerke

3.1 MAP SKILLS AND CALCULATIONS**3.1.1 Bearing:**

- (a) The true bearing of trigonometrical station 275, **M** in block **D4**, from spot height 1 404, **N** in block **C4**, on the topographical map is ... (1 x 1) (1)
- (b) Determine the magnetic bearing of QUESTION 3.1.1 (a) for 2017. Show ALL calculations. Marks will be awarded for calculations. (2 x 1) (2)

3.1.2 Refer to the main road (717) between **O** and **P** on the topographical map.

- (a) Calculate the gradient along the main road (717) between bench-marks 1 357,5 and 1 326,7. Show ALL calculations. Marks will be awarded for calculations.



Formula: $\text{Gradient} = \frac{\text{Vertical Interval (VI)}}{\text{Horizontal Equivalent (HE)}}$

(5 x 1) (5)

- (b) Explain with the help of the topographical map and your answer to QUESTION 3.1.2 (a), why it would be easy to construct the transport routes in the area.

(2 x 1) (2)

3.2 MAP INTERPRETATION

3.2.1 The feature at **3** on the orthophoto map is/a ...

- A library.
- B diggings.
- C cemetery.
- D sewerage works.

(1 x 1) (1)

3.2.2 The feature along the line labelled **R** on the topographical map is a ...

- A spur.
- B saddle.
- C ridge.
- D valley.

(1 x 1) (1)

3.2.3 Study the landforms marked **1** and **2** on the orthophoto map.

- (a) Name the landforms **1** and **2** respectively. (2 x 1) (2)
- (b) Which landform, **1** or **2**, on the orthophoto map has been exposed to erosion the longest? Give a reason for your answer evident on the orthophoto map. (1 + 2) (3)

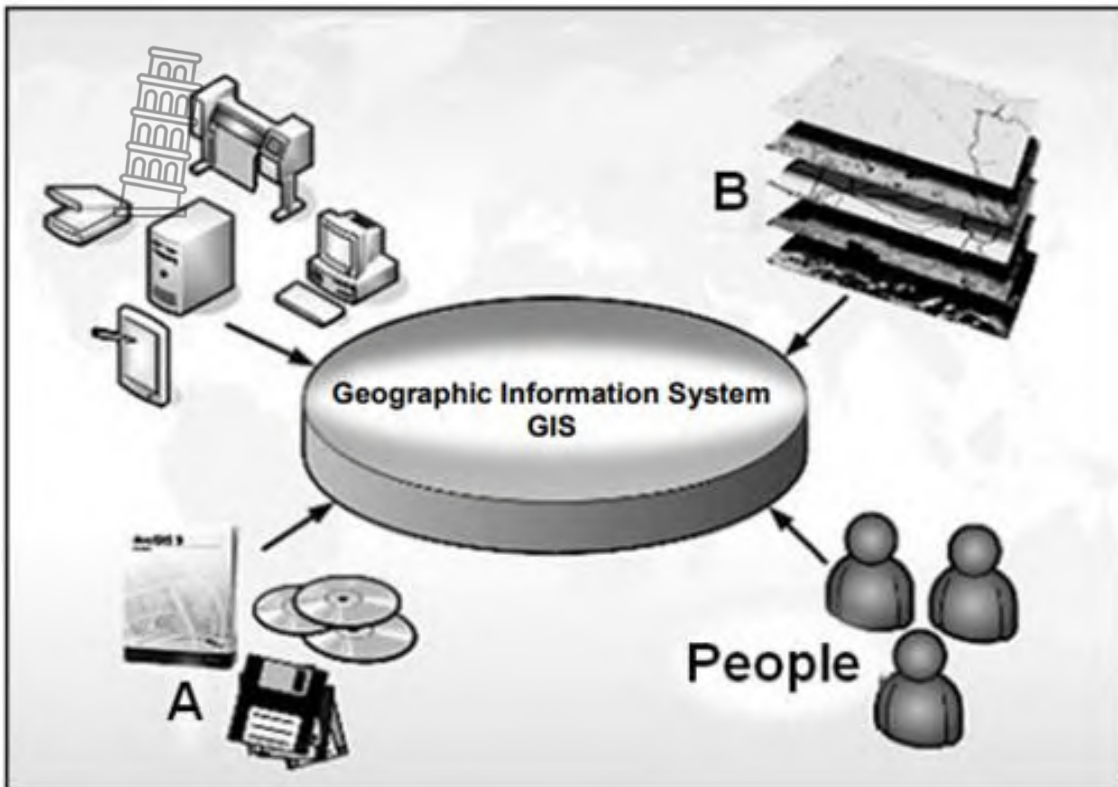
3.2.4 Extensive erosion occurs in blocks **D2** and **E3** on the topographical map. State TWO strategies that were put in place upstream by the farmer in block **C5** to reduce the impact of the erosion. (2 x 1) (2)

3.2.5 Was this aerial photograph used to produce the orthophoto map taken between 09:00 and 10:00 or 14:00 and 15:00? Give a reason for your answer. (1 + 2) (3)



3.3 GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

FIGURE 3.3.1: COMPONENTS OF GIS



[Adapted from Google Images]

3.3.1. FIGURE 3.3.1 shows the different components of a GIS.

- (a) Identify components **A** and **B**. (2 x 1) (2)
- (b) What role do people play in GIS? (1 x 1) (1)

3.3.2 In order to do a paper GIS, it is important to familiarise oneself with the different layers of information. Refer to FIGURE 3.3.1 and the topographical map to answer the questions that follow.

- (a) Are the thematic layers at **B** *raster data* or *vector data* in FIGURE 3.3.1? (1 x 1) (1)
- (b) Name TWO thematic layers you would find in block **B1**. (2 x 1) (2)

3.3.3 The orthophoto map has a high resolution. Give ONE reason for this statement. (1 x 2) (2)



[30]

TOTAL: 150



**NATIONAL
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**GEOGRAPHY P1
MARKING GUIDELINE**

MARKS: 150

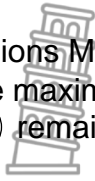


This marking guideline consists of 10 pages.

PRINCIPLES FOR MARKING GEOGRAPHY – NSC NOVEMBER 2022

The following marking principles have been developed to standardise the marking process.

MARKING

- ALL questions **MUST** be marked, irrespective of whether it is correct or incorrect.
- Where the maximum marks have been allocated for a particular question, place an over the **M** remainder of the text to indicate the maximum marks have been achieved. 
- A clear neat tick must be used: ✓
 - If **ONE** mark is allocated, **ONE** tick must be used ✓
 - If **TWO** marks are allocated, **TWO** ticks must be used ✓✓
 - The tick must be placed at the **FACT** that a mark is being allocated for
 - Ticks must be kept **SMALL**, as various layers of moderation may take place
- Incorrect answers must be marked with a clear, neat cross: ✕
 - Use **MORE** than one cross across a paragraph/discussion style questions to indicate that all facts have been considered.
 - Do **NOT** draw a line through an incorrect answer.
 - Do **NOT** underline the incorrect facts


NOTE THE FOLLOWING

- If the numbering is incorrect or left out, as long as the sequence of answers to questions is followed candidates can be credited.
- Spelling errors if recognisable, award the marks provided the meaning is correct.
- Be sensitive to the sense of an answer, which may be stated in a different way
- In questions where a letter is the accepted response but the learner writes the actual answer – award marks.



TOTALLING AND TRANSFERRING OF MARKS

- Each sub-question must be totalled:
 - Questions in Section A has five sub-sections, therefore five sub-totals per question required. Section B has three sub-sections and three sub-totals.
 - Sub-section totals to be written in the right-hand margin at the end of the sub-section and underlined.
 - Sub-totals must be written legibly.
 - Leave space to write in moderated marks on different levels.
- Total sub-totals and transfer total to left-hand margin next to question number
- Transfer total to cover of ANSWER BOOK.

MODERATION

Marking on each level of moderation is done in the same way as the initial marking. All guidelines for marking must be adhered to. 

If a mark for a sub-question is changed after moderation, the moderator must strike through the marker's mark and write down the new mark. 42 16

The total for the question must be re-calculated and similarly be struck off and the total must be written down.  

SECTION A: CLIMATE AND WEATHER AND GEOMORPHOLOGY

QUESTION 1: THE ATMOSPHERE

- 1.1 1.1.1 Westerlies (1)
- 1.1.2 Equatorial low-pressure belt (1)
- 1.1.3 Polar winds (1)
- 1.1.4 Easterlies (1)
- 1.1.5 Polar high-pressure belt (1)
- 1.1.6 Sub-Tropical high-pressure belt (1)
- 1.1.7 Equatorial low-pressure belt (1) (7 x 1) (7)
- 1.2 1.2.1 A to B (1)
- 1.2.2 Pressure gradient (1)
- 1.2.3 Coriolis (1)
- 1.2.4 right (1)
- 1.2.5 high (1)
- 1.2.6 geostrophic (1)
- 1.2.7 low (1)
- 1.2.8 gentle (1) (8 x 1) (8)
- 1.3 1.3.1 Date/ 23/07/20 (1)
South Indian and South Atlantic high are in a northerly direction (close to the land) (1)
Presence of mid-latitude cyclone (cold front) (1)
Clear conditions over most of the interior (1)
Presence of a coastal low (1)
[ANY ONE] (1 x 1) (1)
- 1.3.2 4 hpa/mb (1) (1 x 1) (1)
- 1.3.3 Air temperature – 19 °C (1)
Dew point temperature – 13 °C (1)
Cloud cover – clear (1)
Wind direction – north-easterly (1)
Wind speed – 5 knots (1)
[ANY FOUR] (4 x 1) (4)
- 1.3.4 South Indian high (1) (1 x 1) (1)



- 1.3.5 There will be little/no rain as pressure cell A is close to the land (2)
 Less moisture is carried over the sea to Port Elizabeth (2)
 High pressure cell has ridged over land causing descending air (2)
[ANY TWO] (2 x 2) (4)
- 1.3.6 The western side of the country would experience much lower temperatures because of the influence of the cold Benguela current (2)
 The eastern side of the country would experience moderate temperatures because of the influence of the warm Mozambique current in winter (2) (2 x 2) (4)
- 1.4 1.4.1 **A** – Chinook (1)
B – Föhn (1) (2 x 1) (2)
- 1.4.2 Windward (1) (1 x 1) (1)
- 1.4.3 On the windward side of the mountains, condensation occurs and moisture is released in the form of precipitation (2)
 As the wind rises and moves over the mountain, more moisture is released and eventually becomes drier (2)
 On the leeward side, descending air causes the last available moisture to evaporate as it heats up (2)
 With descending air on the leeward side, there is no condensation (2)
[ANY TWO] (2 x 2) (4)
- 1.4.4 **Chinook:**
 The warm air melts the snow during winter (2)
 This allows for agricultural activities to proceed as water is available (2)
 It also causes more pleasant working conditions during the colder months (2)
 Melting snow may also cause floods (2)
- Föhn:**
 The physical dehydration of people influences production negatively (2)
 Droughts dry up agricultural land (2)
 Veld fires destroys agricultural land (2)
[ANY FOUR – Conditions on both continents must be discussed] (4 x 2) (8)
- 1.5 1.5.1 Overpopulation (1)
 Over-farming (1)
 Deforestation (1)
[ANY ONE] (1 x 1) (1)
- 1.5.2 Area between Saharan desert and Sudanian savannah (1)
 Sahel (1)
[ANY ONE] (1 x 1) (1)

- 1.5.3 They are subsistence farmers (1)
Dependent on fertile soil as a source for food (1)
Farming is a source of income (1)
[ANY ONE] (1 x 1) (1)
- 1.5.4 Reduced crop production, therefore less food production/food security (2)
People would die of starvation/malnutrition (2)
A wide spread of poverty, due to job losses (2)
It would lead to rural urban migration (2)
[ANY TWO] (2 x 2) (4)
- 1.5.5 People from Senegal migrate to other countries to use their resources/ make a living (2)
This puts a strain on the land and less food is produced (2)
Local citizens are unable to feed themselves and depend on government and foreign donations (2)
Conflict between locals and immigrants comes at a great economic cost (2)
Locals and immigrants move to the urban areas which puts more strain on the host country's economy (2)
Immigrants add no value to the GDP of the host countries (2)
[ANY TWO] (2 x 2) (4)
- 1.5.6 There should be afforestation programmes (2)
Effective soil management that should include organic fertilizers, crop rotation and contour ploughing (2)
Allowing the land to be fallowed for a period of time to renew itself (2)
Supporting local farmers with education and training (2)
Programmes on rainfall unreliability and planting drought resistant crops (2)
Natural action plans that could oversee landownership and encourage sustainable management of land (2)
[ANY TWO] (2 x 2) (4)
- [60]**



QUESTION 2: GEOMORPHOLOGY

- 2.1 2.1.1 D – mesa (1)
- 2.1.2 B – Batholiths (1)
- 2.1.3 A – sill (1)
- 2.1.4 B – hogsback (1)
- 2.1.5 A – dyke (1)
- 2.1.6 C – pediplain (1)
- 2.1.7 A – Canyons (1) (7 x 1) (7)
- 2.2 2.2.1 Pediment (1)
- 2.2.2 Cliff (1)
- 2.2.3 Talus (1)
- 2.2.4 Crest (1)
- 2.2.5 Pediment (1)
- 2.2.6 Cliff (1)
- 2.2.7 Talus (1)
- 2.2.8 Crest (1) (8 x 1) (8)
- 2.3 2.3.1 Horizontally layered rocks (1) (1 x 1) (1)
- 2.3.2 The plateau has a uniform height (1) (1 x 2) (2)
- 2.3.3 Rock type on the slopes is not uniform in resistance to erosion (2)
Vertical erosion takes place in cracks and joints (2)
[ANY ONE] (1 x 2) (2)
- 2.3.4 A succession of fissure eruptions causes thick, smooth fluid basalt (lava) to flow onto the earth's surface (2)
The smooth fluid basalt (lava) accumulates horizontally (2)
The layers of basalt give rise to a plateau (2)
Basalt is evident on the top of the plateau (2)
[ANY TWO] (2 x 2) (4)



2.3.5 POSITIVE

The physical stature of the plateau makes it a tourist/recreational attraction e.g. hiking trails (2)

The rugged and steep slopes encourage extreme sports (accept examples) (2)

NEGATIVE

The elevated terrain discourages human settlements (2)

Rugged and steep slopes are not conducive to farming (2)

High altitude causes low temperatures not suitable for human settlements (2)

High altitude promotes formation of frost that limits agriculture (2)

[ANY THREE] (3 x 2) (6)

- 2.4 2.4.1 Shale (1)
Limestone (1)
[ANY ONE] (1 x 1) (1)
- 2.4.2 Inclined layers of sedimentary rock (1)
Gentle dip slope (10–25) (1)
Steeper scarp slope (1)
[ANY TWO] (2 x 1) (2)
- 2.4.3 A – Dip (1)
B – Scarp (1) (2 x 1) (2)
- 2.4.4 Slope B forms from softer rock that weathers quickly (2)
Slope A forms from harder rock that weathers slowly (2)
The harder layer at A erodes slower than the softer rock at B (2)
[ANY ONE] (1 x 2) (2)
- 2.4.5 Volcanic intrusions will cause the strata to tilt (2)
The strata will dip away from the centre or outwards (2)
The dip slope faces outwards and the scarp slope inwards (2)
The intrusion will be dome or mushroom shaped (2)
[ANY TWO] (2 x 2) (4)
- 2.4.6 Fertile valleys and plains between cuestas are suitable for human activity (2)
Circular valleys between cuestas are suitable for the development of infrastructure (2)
The dip slope can be used for forestry, tourism, recreation and nature conservation (2)
Cuesta basins often yield artesian water (2)
Oil and natural gas (fracking) can be sourced from cuesta domes (2)
[ANY TWO] (2 x 2) (4)



- 2.5 2.5.1 Batholith (1)
Laccolith (1)
[ANY ONE] (1 x 1) (1)
- 2.5.2 Core stones (1) (1 x 1) (1)
- 2.5.3 Granite (1) (1 x 1) (1)
- 2.5.4 Chemical weathering in the joints caused them to be broken down in rectangular blocks (2)
Widening of the joints due to weathering caused them to be more rounded (2)
[ANY TWO] (2 x 2) (4)
- 2.5.5 Cracks and joints develop in granite, under the ground (2)
Widens by chemical weathering (2)
Mechanical weathering and erosion remove the surface material, leaving the core stones exposed (2)
Loose material between the core stones is being eroded through mechanical erosion (2)
Base of the tor is still connected to the original intrusion (2)
[ANY FOUR] (4 x 2) (8)
- [60]**



SECTION B

QUESTION 3: MAP SKILLS AND CALCULATIONS

3.1 3.1.1 (a) 203° (1) (range 202° – 204°) (1 x 1) (1)

(b) 203° + (1) 23° 50' = 226°50' (1) (range 225°50' – 227°50') (2 x 1) (2)



3.1.2 (a) Formula: **Gradient = $\frac{\text{Vertical Interval (VI)}}{\text{Horizontal Equivalent (HE)}}$**

Gradient = $\frac{(1\ 357,5 - 1\ 326,7) = 30,8\ \text{m}\ (1)}{(3,9\ (1)\ \text{cm} \times 500)\ \text{m} = 1\ 950\ \text{m}\ (1)}$ (range 1900 – 1920) m

Gradient = $\frac{30,8}{1\ 950}$ (1) [correct substitution]

Gradient = $\frac{30,8}{30,8} : \frac{1\ 950}{30,8}$

Gradient = 1 : 63,31 (1) (range: 1 : 61,69 – 1 : 62,34) (5 x 1) (5)

(b) Contour lines are far apart (1)
Gentle slope/flat land/gentle gradient (1)
No obstructions evident (1)
In this area for every 1 unit vertically the horizontal distance is
1 : 63,31/the average gradient is 1 : 63,31 (1)
[ANY TWO] (2 x 1) (2)

3.2 MAP INTERPRETATION

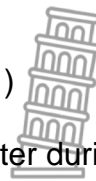
3.2.1 C – Cemetery (1) (1 x 1) (1)

3.2.2 A – Spur (1) (1 x 1) (1)

3.2.3 (a) 1 – pointed butte/conical hill (1)
2 – mesa (1) (2 x 1) (2)

(b) Answer: (1) pointed butte/conical hill (1) (1 x 1) (1)

Reason:
Smaller hard cap rock area (2)
Elevation of the pointed butte (.1421) is lower than the mesa
(.1446/.1454) (2)
[ANY ONE] (1 x 2) (2)




3.2.4 Planting of trees/afforestation allows for infiltration (1)
Building anti-erosion walls prevents run-off (1)
Dams/reservoirs/wind pumps allow for release of water during dry
season (1)
Cultivated lands contour ploughed – commercial (1)
River management practiced – buffer along river (1)
[ANY TWO] (2 x 1) (2)

3.2.5 Answer:
Between 14:00 and 15:00 (1) (1 x 1) (1)

Reason:
The shadows from the highest features fall to the southeast (2) (1 x 2) (2)

3.3 **GEOGRAPHICAL INFORMATION SYSTEMS (GIS)**

3.3.1 (a)  **A** – Software/Programmes (1)
B – Data (1) (2 x 1) (2)

(b) People collect the data (1)
People manipulate and process the information (1)
People use the information (1)
People develop GIS programmes and capture data (1)
[ANY ONE] (1 x 1) (1)

3.3.2 (a) Vector (1) (1 x 1) (1)

(b) Infrastructure (1)
Drainage (1)
Topography (1)
[ANY TWO] (2 x 1) (2)

3.3.3 The map has a higher degree of detail and clarity. (2) (1 x 2) (2)
[30]

TOTAL: 150

