

NATIONAL SENIOR CERTIFICATE EXAMINATION NOVEMBER 2016

GEOGRAPHY: PAPER I

MARKING GUIDELINES

Time: 3 hours 300 marks

These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.

(2)

(2)

SECTION A GEOGRAPHICAL ISSUES

QUESTION 1 GEOGRAPHICAL CASE STUDY: SOUTH PENINSULA REGION, CAPE TOWN

1.1	l Ma	ap worl	k and	map	inter	pretatio	on skills
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1.1.1 Western Cape province (2)

1.1.2 M64 (2)

1.1.3 Constantiaberg (1 mark) - 928 metres (1 mark) (2)

1.1.4 Natural features include:

- Steenberg Ridge
- Silvermine River
- Waterfall

Atlantic Ocean

- Hennies Pool
- Elephant's Eye cave
- Wolfkop/ Higher Steenberg Ridge, Steenberg Plateau (2)

Human constructed features:

- Silvermine Dam/ Old Dam/ Dam wall
- Toilet facilities
- Picnic site/ Tokai picnic site
- Silvermine tented camp
- Parking lot
- Any path
- Any road
- TMNP head office
- Silvermine Gate (Credit any correct answer)

1.1.5 Map distance = 5 cm

Distance one way = 2,27 km

Total hike distance = 4,54 km (Range 4,20-4,80 km)

1.1.6 Picnics

Camping

Swimming (Silvermine Dam)

Mountain biking

Birdwatching

Mountain climbing, possibly fishing

Horse riding

Trail running

Sunbird Centre

Dog walking

Cycling

Photography

Sightseeing

Water sports

[NOT GOLF]

Other: credit any correct answer (4)

1.2 Climate and weather

- 1.2.1 The South Atlantic HP cell has ridged towards the east. Traditionally this system remains within the south-westerly region of the country during the summer months. South Atlantic HP is positioned in the Indian Ocean. There is also the presence of a cold front far north around 30 °S.
- (2)
- 1.2.2 End of summer (early March), high air temperatures upper 20–30 °C. This leads to rising and expanding air, and hence LP conditions. Presence of a heat low, convection low/ thermal low.
- (2)

1.2.3 (a) Southerly direction, also accept SSW, SSE, and SE.

(2)

- (b) South Atlantic HP is prevalent over the SE part of South Africa.
 - An LP system is located over the western coastal area of southern Africa around Lüderitz, in Namibia.
 - A PGF exists between these two pressure systems. Air will move from the HP towards the LP system, resulting in strong onshore southerly winds.
 - Evidence of 15–25 knot south-south-easterly winds is seen from Cape Town up the coast towards PE.
 (2 distinct points must be mentioned. HP and LP systems must be pointed out and the movement of air between these two systems creating the southerly/ SW and SE winds)
 - Steep pressure gradient, isobars are close together, less friction over the ocean.

(4)

- 1.2.4 air temperature = 33 (1 mark) °C (1 mark).
 - wind direction and speed = southerly wind, SSW wind (1 mark), 15 knots (1 mark).
 - no rainfall (2 marks) due to clear skies and large difference between air and dew point temperatures.

(6)

1.2.5 (a) **Raster** data consists of a matrix of cells (or pixels), or blocks of colour organised into rows and columns (or a grid) where each cell contains a value representing information. Photographs 1 and 2 are both images that are made up of pixel data and hence are forms of raster data.

(2)

- (b) **Photo 1** is an infrared short-wave satellite image (artificial/ thermal image), which has the ability to see through smoke. The infrared capability allows vegetation to be seen more clearly and hence the areas of fire damage. Due to the heat emitted, burning fires are also visible. (2 marks)
 - **Photo 2** is basically an aerial photograph from a high altitude (natural/ optical or true colour image), where less detail is seen. The image is also obscured due to the presence of the smoke. (2 marks) (4)

- Which residential areas are most vulnerable to fires, and hence which communities may need to evacuate their homes.
 - Monitoring the wind direction by looking at the smoke; this may assist disaster planners to understand the spread of fire.
 - The scale of the damage is more easily seen useful for working out disaster management funding and budget requirements.
 - Indicates terrain influences accessibility of fire fighters.
 (Any 2 appropriate points)

1.2.6 SURFACE RUNOFF (2 marks)

- Likely to increase after winter rainfall due to the destruction of vegetation and therefore less interception.
- Localised flooding and soil erosion are consequences.
- Less infiltration; more run-off.
- Siltation of rivers or dams
- Runoff may contain ash

LOCAL ECONOMY AND TOURISM

Destruction of natural environment – impact on tourism: (2 marks)

- Destruction of the natural fynbos vegetation in the Table Mountain National Park.
- Smoke damage and pollution.
- Possible soil erosion, rock falls due to destruction of vegetation along mountain paths and steep cliff areas.

Implications on the local economy: (2 marks)

- Massive fire-fighting efforts over 2 000 people involved.
- Costly use of helicopters (26 craft) to drop water.
- Closure of roads.
- Closure of the National Park.
- Impact on big sports events: Argus Cycle Race and Two Oceans Marathon.
- Damage to homes and other properties big insurance claims.
- Overall decrease in tourism/ less income/ business affected.
- Destruction of vineyards/ forestry (Credit any relevant points)
 (6)

1.3 Drainage systems, river catchment and management

1.3.1 Noordhoek Ridge Mountains/ Steenberg Ridge (2)

1.3.2 Fish Hoek (2)

- 1.3.3 Silvermine Dam, and
 - Waterfall
 - Hennies Pool
 - Wetlands
 - Confluence of tributaries (4)

	1.3.4	(a)	The Silvermine Nature Area has a high runoff during the winter months.	
		(b)	The Silvermine River is likely to have a <u>narrow-V-shaped</u> in its upper course.	
		(c)	The Silvermine River has a low/ medium stream density.	(6)
	1.3.5	UrDaPoMiDr	rtilisers and irrigation from the Clovelly Golf Course ban community of Fish Hoek (litter/ toxic waste thrown into the river) ams upstream could reduce flow of water. Illution from local settlements ining pollution (Silvermine), AMD, Climate change rought sing sea level and therefore increase in salinity	
		• Se	dimentation from upstream erosion res affect wetlands	
			ny 2 relevant points)	(4)
1.4	Urban	struct	ure, planning, hierarchies and local economic opportunities	
	1.4.1	(a)	Rural-urban fringe	(2)
		(b)	Forestry (1 mark) and horse-riding (1 mark)	(2)
		(c)	Planned	(2)
		(d)	Density	(2)
		(e)	Informal	(2)
	1.4.2		ed within a largely residential (suburban) area – Sun Valley – and this region.	(2)
	1.4.3	RoAvFla	ocated at the bottom of the M64, at the <u>intersection</u> with Noordhoek oad (M6). Vailable land, cost of land, population density. At in relation to the surrounding mountainous area. rves a broad community: Noordhoek, Sun Valley, Sunnydale.	(4)
	1.4.4	(a)	High order.	(2)
	1.1.1	(u)	 Gym contracts are expensive, a luxury service, not considered a basic need. 	(2)
		(b)	The <u>area</u> from which a service draws its customers.	(2)
		(c)	Sphere of influence would be large (2) – due to the fact that it is a high-order service that is expensive. It would draw on a larger threshold population and hence a larger sphere of influence. Description from map – includes Sun Valley, Sunnydale.	(4)

- 1.4.5 Mall developments need to be in line with the greening of urban areas, which is a global trend (winning of many awards, remediation of carbon emissions).
 - Legislation
 - Developments should be opting to be more sustainable and eco-friendly.
 - Electricity and resource costs continue to rise; developments need to be smart in this regard.
 - Malls need to become energy efficient (reduction in electricity consumption, shifts towards renewable energy), adopt recycling programmes and have such facilities available, encourage the use of alternative forms of transport, include garden, green zones and roof top gardens etc.
 - The Sun Valley Mall refurbishment project has included the following eco-friendly design principles:
 - Materials have been used to effectively reflect heat and energy and also minimise the impact of the heat island effect.
 - Natural resources can be effectively used to create natural light and solar energy can also be harnessed for powering geysers as an example.
 - Climate change
 - Reduction on the carbon foot print, reduce carbon tax
 - SA is a water scarce country, therefore water must be used sparingly and saved

(Credit any relevant point) Why = 2 marks Explain = 6 marks

(8)

100 marks

SECTION B CLIMATE, WEATHER, AND GEOMORPHOLOGY

QUESTION 2 TROPICAL CYCLONES, MID-LATITUDE CYCLONES, CLIMATE CONCEPTS, URBAN AND VALLEY CLIMATES, DRAINAGE SYSTEMS AND FLUVIAL PROCESSES

2.1 Tropical cyclones: Hurricane Patricia

2.1.1 15 storms (2)

- 2.1.2 Warmer ocean (2) explanation: likely to have been above 27 °C due to the warming effects of El Niño (2)
 - Extreme low pressure (2) explanation: low pressure was recorded at 879 mb; very low pressure is associated with rapidly rising air and very unstable conditions, which would have been responsible for the heavy rain and strong winds (2)
 - A variety of more textbook based responses are acceptable:
 - Areas of development between 5° – 30° N and S of the equator.
 - Wide area of LP with some close isobars.
 - Developed along the west coast.
 - Light and variable winds to allow for the formation of a vortex.
 - [Any other appropriate answer]

(8)

(6)

Weather conditions: build-up to	Weather conditions: arrival of
hurricane	hurricane
Continuous rain, winds	Very strong winds – 270 km/ hr
(tropical storm conditions)	Torrential rain – 201 mm in 24 hours
Air pressure ± 900 mb	Storm surges
	Air pressure ± 879 mb, or very LOW
2 marks	pressure
	2 marks

2.1.4 **Homes**:

Trees may have collapsed, damaging roofs, electric cabling

Smashed windows

Telephone lines down

Collapsed gutters – due to quantity of rain

Collapsed walls, fences, structures

Flooded homes – especially low lying/ coastal areas

Water supply cut off/ contaminated

Farmland:

Saturated/ flooded lands destroying crops

Collapsed trees

Animals may have drowned

Equipment damaged (farm implements, harvesters, dairies, storage barns)

(Any 3 suitable points, at least 1 for housing and 1 for farmland)

2.2 Mid-latitude cyclones and synoptic weather map interpretation

2.2.1 A = South Atlantic high pressure (2 marks)/ anticyclone (1 mark); St Helena HP/ only HP (1 mark)

B = South Indian high pressure (2 marks)/ anticyclone/ HP (1 mark)

 $C = Cold front (3 \times 2 = 6)$

2.2.2 (a) On this particular chart, the cut-off low is wedged in between the cold front system to the west (2) and the South Indian HP to the east (2).

(4)

(b) Continuous rain/ heavy rain, with a threat of floods/ strong winds. (4)

2.3 Satellite image interpretation

Multiple choice

2.3.1 B

2.3.2 A

2.3.3 B

2.3.4 C or A

2.3.5 D

 $(5 \times 2 = 10)$

2.4 Urban climate

- 2.4.1 The graph indicates that the areas that are more developed and built up, e.g. Johannesburg, Pretoria and Rustenburg, have a <u>lower temperature</u> range.
 - There is <u>little discrepancy in day time</u> temperatures, all of which are around 28–30 °C.
 - Less built-up areas of the Cradle of Humankind and Mooinooi have a <u>higher</u> temperature range.
 - Summer temperatures are all over 25 °C.
 - There is a large temperature range for January.

(4)

- 2.4.2 Cradle of Humankind approximately 17 °C. (2)
 - This area is a rural World Heritage Site. The Cradle area is a nature reserve and has an abundance of grassland and trees. There is little urban development. As a result when the sun sets, there will be greater terrestrial radiation and little contribution of re-radiated heat from buildings or pollutants within the immediate atmosphere. (2)
 - Any factor that explains why rural areas will be cooler

(4)

- 2.4.3 Planting trees
 - Creating green belts (more parks/ green areas/ roof top gardens).
 - Incorporating more bodies of water into the area (e.g. small dams, fountains).
 - Using natural building materials (stone, wood). Light building materials to reflect heat.
 - Sustainable energy (solar and wind power).
 - Reducing vehicle emissions through encouraging car pools, cycling, use of public transport, etc.
 - Filters on chimneys, regulations regarding emissions for industrial areas.
 - Paint roof areas white
 - Build roads out of concrete, not tar
 - Fine people who do not adhere to regulations
 - Build factories towards the outskirts of town (Any 3 appropriate points)

(6)

2.5 Valley climate within the Cradle of Humankind

2.5.1 Cool air will drain into the bottom of the valley at night (2); this is due to the katabatic air flow due to gravity (2). Cooler, denser air will collect at the bottom of the valley at night. In the early morning the valley has not warmed up as yet.

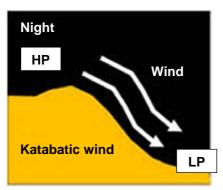
Air cools through terrestrial radiation.

(4)

2.5.2 (a) Katabatic wind

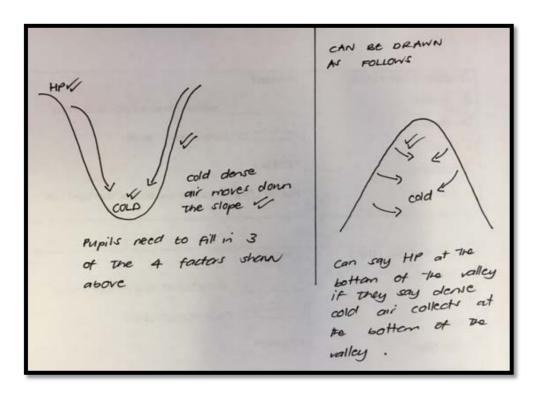
(2)

- (b) Direction of air flow (2)
 - Air pressure (2)
 - General temperature of air (cool, dense hence sinks) (2)



The mountain cools down; the air becomes heavier so it descends.

(6)



2.6 **Drainage systems and fluvial processes**

2.6.1 Magaliesberg Mountain Range

(2)

2.6.2 (a) (2 marks) **Rectangular**-tributaries have right-angle bends along their course.

There are relatively few tributaries and rivers within the basin as indicated on the map, hence the low drainage density and **coarse texture**. Tributaries join main river at right angles.

Provide an explanation for either pattern or texture (2 marks)

(4)

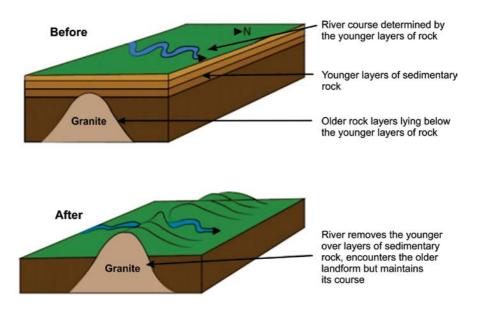
2.6.3 When a river displays a superimposed drainage pattern, it encounters **older** rock layers (2) below the surface due to vertical erosion. The river is able to maintain its course (2). The landscape is older than the river.

(6)

2 marks for use and inclusion of correct diagram. Before and after situation is not necessary to include. Candidates must indicate that the river flows through older rock layers (2), and the river has maintained its original course (2).

Drawing = 2 marks

Explanation or detailed labels = 4 marks



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<i></i>	n	.4

Hydrograph curve A	Hydrograph curve B
Catchment area 1: (2)	Catchment areas 2: (2)
This curve is associated with a flash flood situation, due to the short lag time and high flood peak. This situation indicates a drainage pattern whereby runoff reaches the river systems very quickly. This is due to the fact that this catchment area is more built up and will have more roads and concrete surfaces resulting in rapid runoff. (2)	This curve indicates a lower chance of flooding, due to longer lag time and lower flood peak. Catchment area 2 is less developed, with more open areas; runoff is likely to be less since there will be greater infiltration. (2)

(8)

2.7 **Types of rivers**

2.7.1 F

2.7.2 A

2.7.3 G

2.7.4 E

2.7.5 B

(10)

100 marks

SECTION C QUESTION 3		l	RURAL AND URBAN SETTLEMENTS AND THE ECONOMY OF SOUTH AFRICA			
		3	RURAL AND URBAN SETTLEMENTS, A CASE STUDY OF IRON ORE MINING AND THE DURBAN-PINETOWN INDUSTRIAL REGION			
3.1	3.1.1	(a)	The settlement shows a <u>nucleated</u> pattern.			
		(b)	The main economic activity in the area forms part of the <u>primary</u> sector.			
		(c)	The settlement would be located on the <u>north-facing slope</u> .	(6)		
	3.1.2		e is evidence of outside pit latrines/ toilets provided – each homestead mall zinc/ corrugated iron enclosure with ventilation pipe. Long drop/ ation.	(2)		
	3.1.3	(a)	Residents would leave: unemployment — no jobs to provide an income. Poor soil quality, poor farmland, environmental disasters e.g. floods/ drought. No social activities, poor infrastructure. Limited access to services such as healthcare and education. Perceived jobs, education, social activities, better transport. [Can be push and pull factors] (Any suitable, relevant reason)	(4)		
		(b)	Young men and women would leave; and the children and elderly would be left behind. Lack of manpower to farm may mean decline in productivity or loss of food security. Poverty may increase. Social issues. (Any suitable, relevant prediction)	(2)		
3.2	3.2.1	Flat l	r – developed along the floodplain of the Berg River. and – along the valley floor of the Berg River. e soils – evidence of agriculture in the area.	(4)		
	3.2.2	(a)	Linear settlement shape. Ribbon, in a straight line (not nucleated as this is a pattern)	(2)		
		(b)	According to the Fact File – developed between Paarl Mountain and the Berg River – both linear features; as well as the fact that Main Road is 10 km long. The physical features – Berg River and Paarl Mountain form linear barriers along which the town developed. Straight road and railway line.	(2)		
	3.2.3	(a)	CBD, Central business district.	(2)		
		(b)	Building density. Building height. Concentration of high-rise buildings. Church steeple seen in the area. Central Grid iron street pettern	(2)		
			Grid iron street pattern	(2)		

(4)

(4)

(4)

3.2.4 Close to the production site – raw-materials industry; reduces transportation costs and time.

Close to the market – town.

Available space; good infrastructure, cheaper land.

Outskirts, away from residential areas to avoid nuisance factors

Along transport routes

Close to river (4)

3.3 **Terminology**

- 3.3.1 F
- 3.3.2 G
- 3.3.3 D
- 3.3.4 H
- 3.3.5 A (10)

3.4 Iron ore mining in South Africa

- 3.4.1 (a) Saldanha Bay and Richards Bay (1 mark each) (2)
 - (b) Sishen (2 marks)—Postmasburg area of the Northern Cape/ Kathu (2)

3.4.2 (a) Raw materials orientated industry

Where industry is located close to the raw materials to reduce production costs as well as transportation costs.

(b) **Beneficiation**

A process where ores are processed (refined/ pre-processed) to add value to the product before being exported. Metals and minerals are converted into manufactured goods.

3.4.3 As 80% of our iron ore is being exported, the country is losing money on not processing the ore and producing products that can then be exported. This will affect the local economy – not putting value back into the GDP and this cuts down on potential jobs. By producing steel, which is an alloy of iron ore, metals are combined to give **different steel products**, which can in turn be made into steel components for the construction industry. This leads to **economic growth (increased forex)**; and **increase in the local economy** and to **job creation**.

3.4.4 They are not close by – for example at Newcastle; Saldanha Bay and Vereeniging and Witbank. These are not iron-producing areas. However, as steel is also made, it needs a variety of other raw materials, thus all raw materials are transported to the factory.

So for example a factory is located where the raw materials can be brought to the factory; not where only one of the ores is mined. Must refer to location of factories in relation to mines.

3.5

3.4.5 (a) (i) 2011 – about US\$170 (allow US\$160–175) (1) (ii) 2015 – about US\$70 (allow US\$ 60–75) (1) (b) US\$170-70 = US\$100 difference or drop in price allow between US\$90–110. If (a) (i) and or (ii) incorrect, can get marks for method, i.e. Carry over error. (2) (c) Iron ore mines will struggle to keep producing, particularly if they are marginal mines (low-grade ore). Jobs will be at stake – as the mines will start cutting back and large scale retrenchment will increase unemployment rate. Mines close and loss of forex. (4) (d) Because China's GDP is declining and the growth is slowing down, less iron-ore will be needed. This will directly impact on the mines as so much iron ore is exported to China. This will have an impact on jobs in the mining sector and retrenchments will occur. The country should look at growth of the local industry and more beneficiation should take place. OR Demand may increase in other countries, e.g. emerging economies such as India – SA will then benefit by exporting more to different regions. (4) **Durban-Pinetown Industrial Region (KwaZulu-Natal – KZN)** Coastline means that development can only take place up and down the coast or inland. Coast on one side and hilly topography to the West. Semi-circle of development – but as most roads and transport routes converge on the city and harbour, this leads to congestion. (2) The relocation of the airport to north of Umhlanga and the development of Dube Tradeport as an industrial development zone (IDZ) has helped reduce the congestion south of Durban. This also has a multiplier effect around the IDZ - concentrating the logistics industry for more effective trade. Development spread out from the core.

Creates a second loading point along the 'freight corridor' for the Free State and Gauteng – will also reduce congestion in the harbour area. Reduces pollution build up. Spreads employment, wealth and skills.

(6)

ESSAY QUESTION

3.5.3 • **Mention** the benefits of industrial growth for the province.

Increases GGP/ GDP.

More employment opportunities, wealth and skills.

• **Evaluate** the important role of infrastructure to the success of this industrial region.

Port means exporting and importing.

Break-of-bulk point – road and rail to shipping.

Has good links to the inland market of Gauteng – N2 and rail.

Markets of Asia and East Africa via the port.

Dube Tradeport, deep water harbour

Rail upgrades at Cato Ridge

Container port leads to more trade opportunities

Electricity supply

King Shaka airport

Expansion of the Toyota assembly plant

[Can also discuss negative impacts]

• Outline the kinds of manufacturing in this region

Using natural materials produced in the hinterland and processing before export: sugar refining (Illovo & Hullets).

Wood from plantations – makes rayon – a silk-like fibre (textiles) for clothing; pulping to make paper (Sappi and Mondi); wood chipping before exporting.

Oil refining – crude oil is brought to Durban and piped to the refineries to make petroleum products (Engen and Sapref)

Chemicals and Paint (AECI)

Car manufacturing/ assembly (Toyota)

Boat building

Computers (Mecer)

• **Highlight** some of the problems faced by this industrial region.

Congestion.

Pollution – collects in city bowl basin

Aging infrastructure

Climatic factors, e.g. humid air leading to oxidation and rust

HIV/ AIDS – impact on the workforce

Volatility of the Rand

Drought and flooding issues

Power outages and load shedding

Corruption within municipalities

High labour costs, labour strikes and unrest

Skills shortage and illiteracy

Various other socio-economic issues

(Accept other problems which may be relevant to the region) (24)

Criteria	(Level 3) Excellent – Good	(Level 2) Satisfactory	(Level 1) Poor
 Writing skills Taking into consideration structure and presentation. Use of brief introduction and conclusion. Logical discussion and use of subheadings. [5 marks allocated to this component] 	(4–5 marks) Suitable introduction and conclusion. Sophisticated, coherent and structured writing. Subheadings and paragraphs have been effectively used. Report is concise, well-structured and succinct.	(3 marks) Introduction and conclusion present, although not ideal. Attempts to adhere to subheadings and use of paragraphs. Report deviates from the point in places and lacks brevity.	(0–2 marks) Writing is weak and almost unintelligible. No introduction or conclusion provided. No use/ adherence to subheadings. Long sentences, poor grammar and ineffective use of paragraphs. Report is repetitive. Bullet points may have been used. 1 = must be awarded for any form of written attempt/ effort.
 Content knowledge Correct use of geographical terminology and concepts. Adherence to topic and subheadings. [14 marks be allocated here] 	(14–12 marks) Relevant content and detailed discussion of topic. Good usage of geographical terminology and concepts. Appropriate number of facts presented/subheading. Min of 2 points for every sub-heading will earn candidate 12 marks. Extension work will provide a further 2 marks.	(11–7 marks) Some relevant content. An overview/ general discussion of key issues. Basic usage of geographical concepts and terminology. (60–50% of required facts presented/ subheading). 1 point/ sub-heading, or 2 points provided and only 2 paragraphs.	Digression from the topic. Weak grasp of concepts and terminology. Superficial/ poor discussion. Almost no relevant facts/ subheading.
 Supporting evidence – analysis and understanding The ability to analyse and evaluate the topic is assessed in this category. Reference made to case study material/ Fact File/ source material provided. If appropriate, reference must be made to familiar/ local or other examples. [5 marks allocated to this component] 	(5–4 marks) The candidate is able to argue and evaluate appropriately. There is strong evidence of accurate application of understanding and evidence provided. Report demonstrates understanding and integration of relevant case study/ Fact File/ source material into the context of the report. Looking for evidence of unpacking content and high order integration.	(3 marks) Superficial links made to case study/ Fact File/ source material. Although reference to supporting examples has been made, it is not clear that the candidate has a good understanding of the example/ case study material. Supporting evidence does not always relate appropriately to the subheading or context of discussion. Discussion lacks depth.	(0–2 marks) Limited to no reference made to case study/ Fact File/ source material. Examples not provided. Has little to no geographical meaning. Little analysis or understanding. Demonstrates minimal understanding of topic.

100 marks

Total: 300 marks

The following marking codes were used in the assessment of the essays

	CONTENT
GEOGRAPHY ESSAY CODES	
E - Excellent	Underline relevant points if correct
$G-{\sf Good}$	Circle incorrect points
V – Vague	EVIDENCE
R – Repetition	Place in ()brackets where candidates have used
I – Irrelevant	evidence
F - Fair	