



GEOGRAPHY THEORY: PAPER I

Reading time: 10 minutes
Time: 3 hours

300 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This paper consists of 20 pages. Please check that the paper is complete.
 2. Study the source material very carefully. This information will help you answer the questions with insight and understanding.
 3. Read the questions carefully.
 4. Section A is **compulsory** and must be answered by all candidates.
 5. Note the choices in Section B and C.
 6. Credit will be given for interpretation and explanation.
 7. You are encouraged to use sketch maps, diagrams and other explanatory diagrams to support your answers whenever relevant.
 8. Number your answers exactly as they appear in the examination paper.
 9. It is in your own interest to write legibly and present your work neatly.
 10. There is a glossary of words on the final page which will help you to understand exactly what the words printed in bold in the questions are asking you.
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SECTION A COMPULSORY QUESTION

Environmental Issues

Read the extract and study Figure 1 carefully.

SALDANHA BAY

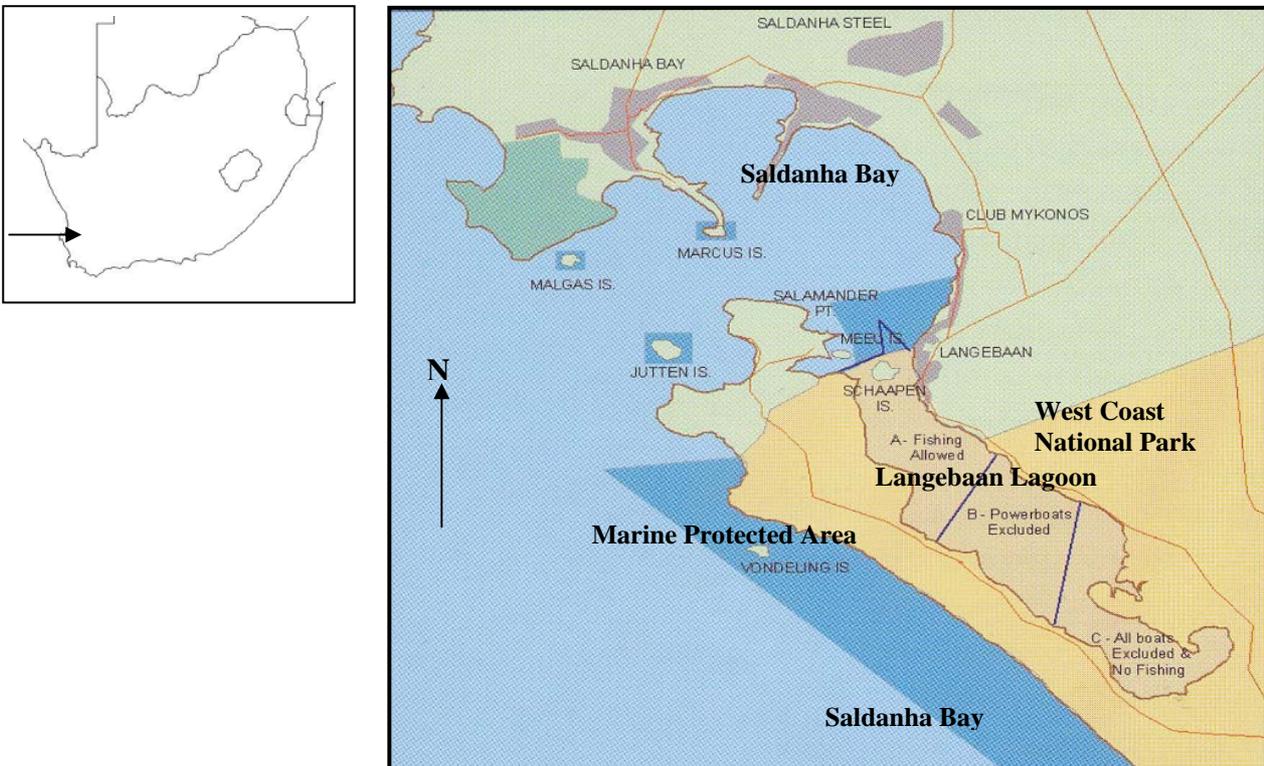
Saldanha Bay is situated on the west coast of South Africa, approximately 100 km north of Cape Town and is directly linked to the shallow, tidal Langebaan Lagoon. The Bay and the Lagoon are considered to be one of the Biodiversity 'hotspots', the Langebaan Lagoon, having been proclaimed a Ramsaar Site*. However, the history of the area has been one tainted with both exploitation and abuse, the environment being the loser in both instances.

**A Ramsaar Site is an internationally protected wetland, ensuring the sustainable use and conservation of the site.*

[Extract adapted from: *State of the Bay Report, 2006*]

Figure 1 Saldanha Bay and Langebaan Lagoon showing the extent of development.

Saldanha Bay, Western Cape



[Source: *State of the Bay Report, 2006*]

A brief history of the area

In the 1970s, the former fishing harbour was upgraded into one of the largest seaports in South Africa, to accommodate the export of iron ore which is brought in by rail from Sishen, hundreds of kilometres away in the arid Northern Cape, on trains that are often well over a kilometre in length.

The Saldanha Steel production plant was opened in the mid-nineties. Saldanha Steel is a South African company, originally formed as a partnership between Iscor Limited and the Industrial Development Corporation (IDC). The R6,8 bn Saldanha Steel development, situated on the Cape west coast roughly 10 km away from the Langebaan Lagoon's ecologically sensitive wetlands, has been designed to produce 1,25 Mt hot-rolled carbon steel coil per year.

[Adapted from: <www.discoverthecape.com/westcoast/langebaan>]

QUESTION 1

1.1 Saldanha's economy and associated consequences

- 1.1.1 Using the source material to assist you, **identify** THREE economic activities that take place within the Saldanha Bay region. (6)
- 1.1.2 Historically many people settled in this area as a result of the rich fishing grounds. **Explain why** South Africa's west coast is well known for its fishing industry. (4)
- 1.1.3 International scientific studies carried out in 2006 have indicated that one-third of fish stocks worldwide have collapsed. As a result, increasing concern has been generated amongst environmental bodies in South Africa.
- (a) **List** some of the South African strategies in place to help protect our diminishing fish stocks. (6)
- (b) Many of these strategies and regulations are having serious consequences for South Africa and its population. **Discuss** these consequences. (8)
- 1.1.4 According to the source material the Langebaan Lagoon has been declared a Ramsaar Site.
- (a) **Suggest** why it is important to declare places Ramsaar Sites. (4)
- (b) **Name** TWO other examples of Ramsaar Sites in South Africa. (2)

1.1.5 Pollution is of major concern within this harbour area and the surrounding environment.

Why is the Saldanha Bay environment ecologically sensitive?

Explain your answer using the source material to assist you. Use a sketch diagram as part of your response. (10)

1.1.6 **Compile** a list of the types of pollution which may threaten this ecologically sensitive area. (8)

1.1.7 The decision to build the steel plant at Saldanha sparked intense conflict between environmental groups, the developers and the local community.

Write an essay in which you weigh up the positive and negative effects of the construction of this steel mill on the above stakeholders. (15)

1.1.8 The future of Saldanha Bay, the Langebaan Lagoon and surrounding communities essentially lies in the sustainable development of its current and future economic and environmental plans.

Discuss the relevance of this statement. (5)

1.1.9 The Saldanha Municipality recently had a planning workshop in which various strategies were put forward with respect to the future development of the area. These strategies are listed below:

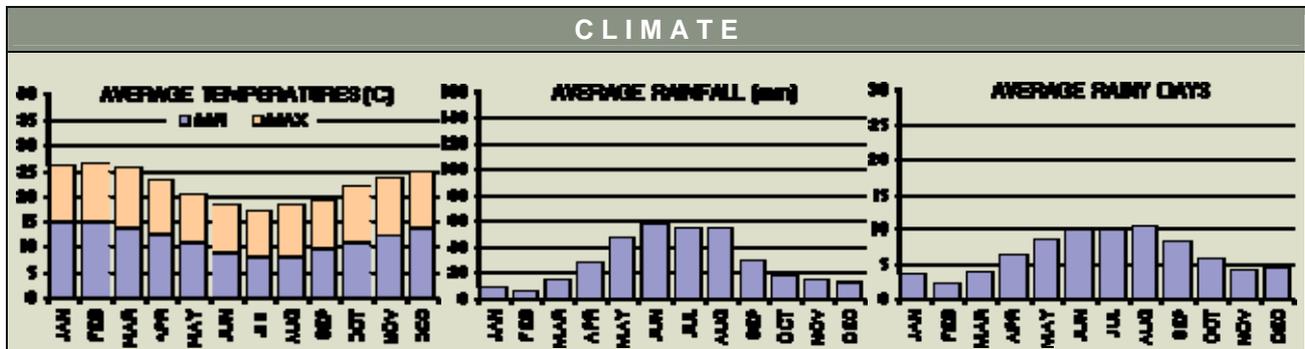
- (a) A large oceanarium to be built in Saldanha Bay to attract tourists and allow for marine research.
- (b) An equipment control depot to be installed at Saldanha harbour to monitor the size and quality of fishing nets, as well as the state of repair of ships and fishing vessels.
- (c) An annual wildflower show to be hosted at the Visitor's Centre at the West Coast National Park.
- (d) A power boating exhibition and race within the Langebaan Lagoon.
- (e) Tourist boat trips departing from the Cape Nature Conservation Area to Malgas Island.

Based on your answer in question 1.1.8, select THREE of the Municipality's strategies which you feel are most appropriate to the development of the area. **Provide** good motivating reasons for each selected strategy. (9)

1.2 Hazards and Environmental Management

Study the graphs below:

Figure 2 Climatic Information for Saldanha Bay



[Source: http://www.saexplorer.co.za/maps/wcape/saldanha/aldanha_municipality.asp#CLIMATE]

1.2.1 Study the annual average rainfall statistics for Saldanha.

- (a) Does Saldanha receive a summer or winter rainfall? (2)
- (b) **Calculate** Saldanha's total annual rainfall (mm/pa). (2)

1.2.2 Based on the above calculation, you would have noticed that Saldanha has a low rainfall, making it very prone to drought conditions.

- (a) **Account for** Saldanha Bay's low rainfall figures. (4)
- (b) Drought conditions are particularly a concern during the summer months. **Provide** reasons this observation. (4)
- (c) How might drought affect the region of Saldanha Bay? (3)

1.2.3 With the threat of climate change, water shortages will become more frequent. **Draw** up a water management plan for the communities living in Saldanha Bay and the surrounding areas. Your answer must be in the form of a **mind map**. (8)

100 marks

SECTION B WATER MASSES AND ECOSYSTEMS

Answer either Question 2 OR Question 3 in this section.

QUESTION 2

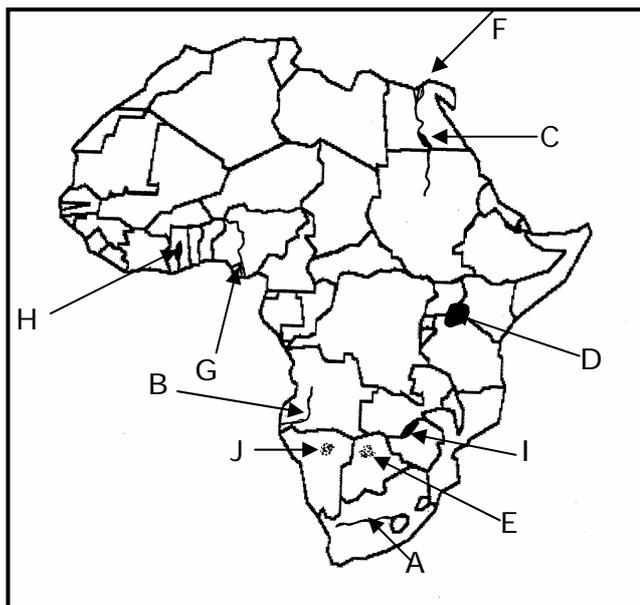
2.1 Africa's Water

2.1.1 Refer to Figure 3 below. **Identify** the correct water mass for each letter represented.

- A – Large river flowing through central South Africa
- B – Significant river in Angola
- C – Dam in Egypt
- D – Large East African Lake
- E – Large inland delta
- F – Significant depositional feature in Egypt
- G – River flowing through Nigeria
- H – Large lake in Ghana
- I – Lake on the Zambezi River
- J – Salt pan

(10)

Figure 3 Africa's Water Sources

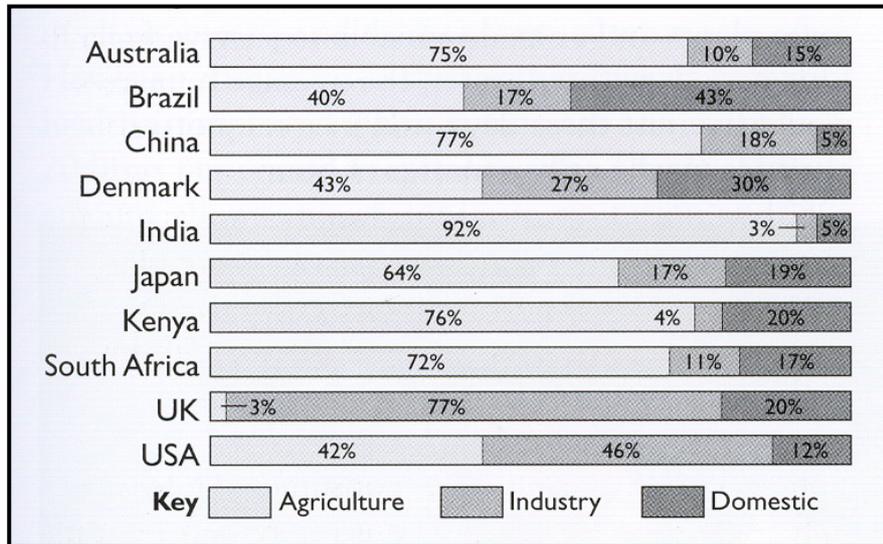


2.1.2 **Indicate** whether each statement below is true or false. **Provide** a valid reason for your decision.

- (a) One of the ways in which rainwater reaches the groundwater supply is through the impermeable layer of surface rock. (2)
- (b) Artesian basins found in the Sahara Desert allow ground water to rise naturally to the surface, provided that a well has been sunk into these basins. (2)
- (c) Deforestation allows for greater infiltration of runoff into the soil, in that there are fewer trees to absorb and intercept the rainwater. (2)

- (d) A number of fresh water lakes are found within the East African Rift Valley. (2)
- (e) A delta forms at a river mouth, where ocean waves deposit large amounts of sediment into the river bed, splitting the mouth of the river channel. (2)

Figure 4 Percentage Water Use by type, 2000



[Source: *The World's Water 2000-2001 in Water Supply*. Bowden, 2002]

2.1.3 Study Figure 4 above.

- (a) According to the graph, which activity consumes the greatest amount of water for the majority of countries? (2)
- (b) **Explain** why this particular activity consumes so much water. (4)

2.1.4 According to Figure 4, the United Kingdom (UK) consumes a relatively small amount of water for agricultural purposes compared with industrial purposes. **Account for** this observation. (4)

2.1.5 Domestic water consumption is on the increase. **Propose** suitable water conserving strategies people could adopt in their homes to reduce water consumption. (6)

2.1.6 You have studied various examples of water masses in Africa. Choose ONE of the examples you looked at during the year and draw a mind map in which you highlight the significance of this resource. Include at least 3-4 main points. (8)

2.1.7 "We drink it, we generate electricity with it, we soak our crops with it. And we're stretching our supplies to breaking point. Will we have enough clean water to satisfy all the world's needs?" Peter Gleick, President of the Pacific Institute, an environmental think tank.

Write a short essay (one page) in which you comment on the validity of this statement. Use the following subheadings in your essay:

- Uses of water
- Water supply versus water demand
- The future of water supply (10)

2.2 Marine and Coastal Ecosystems

Coral reefs are one of the most highly productive ecosystems in the world. Their ecology is complex, with intricate relationships between plants, animals and bacteria. The corals themselves consist of a **symbiotic relationship** between algae and the coral.

Benefits of algae to coral	Benefits of coral to algae
<ul style="list-style-type: none"> • Removes coral waste • Provides nutrients to coral • Accelerates coral skeleton growth 	<ul style="list-style-type: none"> • Provides a safe habitat out of reach of grazing animals • Coral waste products from digestion provide nutrients for algae

2.2.1 **Explain** what you understand by the term symbiotic relationship. (4)

2.2.2 Coral reefs are vertically layered according to the depth of the water and the wave activity along the coastline. This provides a large range of niche areas and thereby increases the biodiversity of the reef. Sadly the biodiversity of many coastal areas is under threat.

- (a) What is a niche area? (2)
- (b) Why is a large biodiversity important? (4)
- (c) **List TWO** potential threats to coastal ecosystems. (4)

Read the extract below which features the rising concerns around Australia's Great Barrier Reef.

Perhaps the greatest management challenge for the Great Barrier Reef World Heritage Area still lies ahead. Global Warming is raising ocean temperatures. When corals undergo certain kinds of stress, the algae that live within the coral (providing the coral with essential nutrients) die. The coral takes on a bleached* appearance as the green algae disappears. Ultimately bleached corals die. Scientific studies have linked bleached corals to increasing ocean temperatures. During the El Nino event of 1982-3, bleaching killed more than 50% of corals on some reefs. Corals are more vulnerable in areas where human activity has already resulted in large scale ecological disruption.

The 1997-8 El Niño event was severe, with 88% of reefs suffering bleaching. Future climate predictions indicate air temperatures could be 2.7°C higher by 2070. Higher temperatures will bleach more coral. Higher rainfalls associated with more frequent and extreme El Nino events would increase river flow into the Barrier reef, increasing sedimentation, and decreasing salinity, both major stresses for corals. Increased storm activity will also affect reef areas.

(***bleached**: the loss of colour, in this case as a result of the death of the algae living within the coral.)

Location of the Barrier Reef



[Source: Adapted from: *Global Challenge*, McNaught and Witherick, 2001.]

- 2.2.3 According to the extract, what is the major threat to the diverse ecosystems of the Barrier Reef? (2)
- 2.2.4 **Explain** how the symbiotic relationship between the corals and algae is affected as a result of the above-mentioned factor. (6)
- 2.2.5 The article mentions the El Niño events of the 1980s and 1990s. **Provide** a brief explanation of the El Niño phenomenon. (6)
- 2.2.6 Based on the information in the source:
- (a) How have these two El Niño events affected the coastal areas of North-Western Australia? (2)
 - (b) **Discuss** the impact El Niño has had, and will continue to have on the Barrier Reef ecosystems. (8)
- 2.2.7 **Identify** FOUR key strategies ecologists could adopt to prevent further damage to coastal ecosystems around the world. (8)

100 marks

OR

QUESTION 3

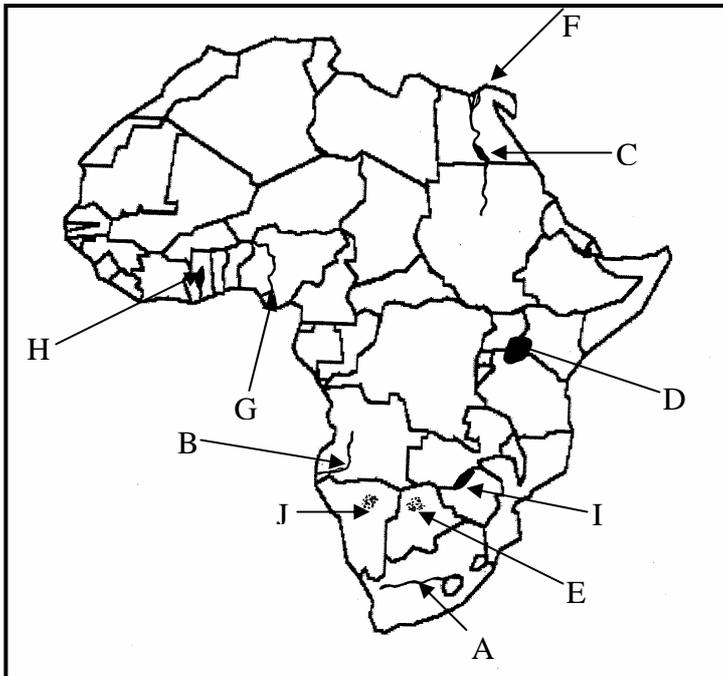
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(10)

Figure 5 Africa's Water Sources



3.1.2 **Match** the correct term in Column A with the correct explanation in Column B. (10)

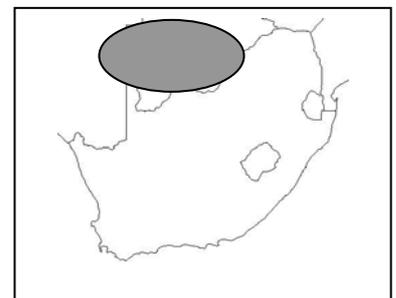
	COLUMN A	COLUMN B
(a)	Inter-basin transfer scheme	(i) Mount Kenya, Mount Kilimanjaro and the Ruwenzori mountains
(b)	Okavango	(ii) A large inland delta in Botswana
(c)	Permeable	(iii) A coastal area where salt and fresh water mix
(d)	Estuary	(iv) Fresh water is transferred from one river basin to another basin via a pipeline and/or pump scheme
(e)	Glaciated Highlands of Africa	(v) Porous rock
(f)	Etosha Salt Pan	(vi) Underground water that naturally rises to the surface
(g)	Artesian well	(vii) A great swamp in southern Sudan
(h)	The Sudd	(viii) A dam on the Nile River
(i)	Aswan	(ix) Overland flow of water
(j)	Runoff	(x) Fresh water mass which has largely evaporated found in central Namibia
		(xi) A wetland

The Kalahari: The Great African Thirstland

The word '*Kalahari*' comes from the Setswana word *Kgalagadi* meaning 'Great thirst'. This dry basin region covers around 260 000 km². Although this area is very dry, and many people would classify it as a desert, experts believe that it is rather part of Africa's extensive savanna and grassland biome.

Much of Botswana falls into the Kalahari. In the 1970s Botswana agreed to be part of the European Union Beef Protocol. This has paid above average prices for Botswana's beef. This money allowed for the drilling of several deep borehole structures, consequently the landuse in the Kalahari has changed from low-density hunter-gatherer type populations to borehole centred livestock farming. The consequences on the wildlife in the area and the savanna ecosystems have been disastrous.

The location of the Kalahari



[Source adapted from: *Global Challenge*,McNaught and Witherick, 2001]

3.1.3 **Provide** a short description of southern Africa's savanna and grassland biomes. (6)

3.1.4 How and why have Africa's biomes changed over the last century? **Discuss** your ideas. (6)

3.1.5 Into which water supply do borehole systems tap into? (2)

3.1.6 **Explain** why borehole water is highly sought after in Africa. (4)

3.1.7 Boreholes encourage cattle to congregate in one area, rapidly overwhelming the carrying capacity of the area, while under utilising the grazing land in more isolated areas.

- (a) What do you understand by the term carrying capacity? (4)
- (b) Why is it important for cattle farmers to monitor the carrying capacity of their farm? (4)
- (c) Would you classify the cattle farming done in Botswana as commercial or subsistence stock farming? **Provide** TWO reasons to support your answer. (4)

3.1.8 As a result of the cattle farming, the soil quality has declined in the area.

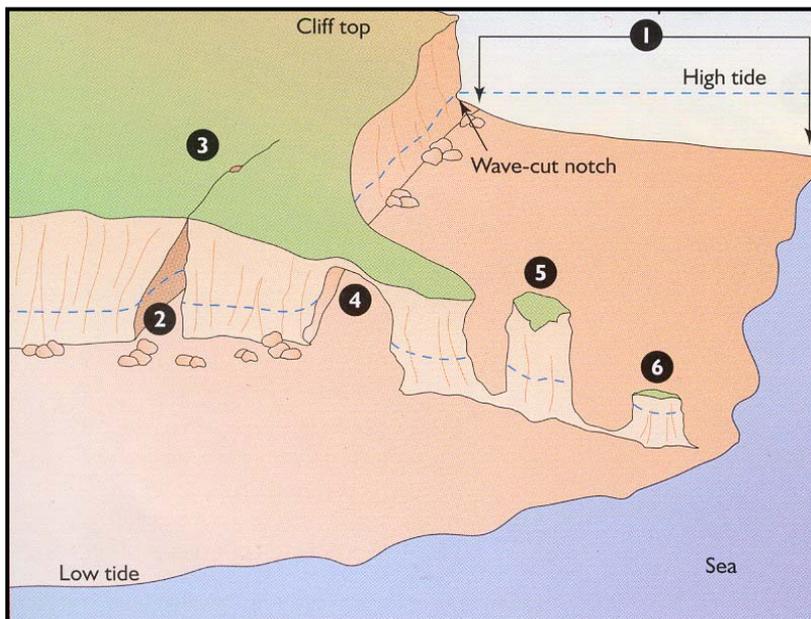
- (a) **Draw** two soil profiles, illustrating the situation **prior** to cattle farming and then **after** cattle had been introduced. (6)
- (b) **Explain** the differences between each profile. (4)

3.1.9 In your opinion, is cattle farming a sustainable form of landuse in this area? **Discuss**, giving alternative suggestions for landuse, if you are in disagreement of cattle farming taking place. If you agree with the statement, **explain** your point of view. (8)

3.2 Coastal Environments

Study Figure 6 below.

Figure 6 Formation of Headland Features



[Source: *People, Places and Themes*; Bilham-Boult A *et al*, 1999.]

3.2.1 Figure 6 illustrates various headland features of coastal erosion.

- (a) **Explain** what a headland is. (2)
- (b) **Identify** features 1-6 on Figure 6. (6)
- (c) **Describe** the processes involved in the formation of feature number 4. (4)
- (d) **Draw** a sketch of Figure 6 in two hundred years time. How will this coastline change? (4)
- (e) Using a **diagram** and short notes, **explain** how headlands contribute to the formation of a beach. (6)

3.2.2 Tourism benefits many coastal regions around the world, yet evidence suggests that if coastal tourism is not managed in more of a sustainable manner, the future of these areas will be under serious threat.

Write a short essay (one page) in which you:

- (a) **Discuss** the negative impact tourism is having on coastal areas.
Provide **suggestions** as to how coastal areas could be better managed to ensure sustainability. (10)

100 marks

SECTION C DEVELOPMENT, SUSTAINABILITY AND PEOPLE AND THEIR NEEDS

Answer either Question 4 or 5 from this section.

QUESTION 4

4.1 Development and Sustainability

4.1.1 **Indicate** whether the statements below are true or false and provide a suitable reason to support each decision.

- (a) Development always means a better life for all. (2)
- (b) Sustainability is about the use of natural resources and the environment at an uncontrolled rate. (2)
- (c) Rostow's development model is based on a Western Capitalist model of development and growth. (2)
- (d) Globalisation has encouraged the development of all nations. (2)
- (e) Life expectancy is a social development indicator. (2)

Study the cartoon below.

Cartoon 1:



[Source: *People, places and Themes*, Bilham-Boult, A. et al, 1999.]

4.1.2 Refer to Cartoon 1.

- (a) **Account for** the acronyms LEDC and MEDC, providing an example of each. (6)
- (b) How does the cartoonist portray LEDCs and MEDCs? (6)
- (c) In your opinion, is the cartoonist's representation of LEDCs and MEDCs entirely accurate? **Discuss**, giving examples where appropriate. (8)

4.1.3 "Women should be key participants in and beneficiaries of policies, programmes and projects concerned with both poverty eradication and achievement of social and political improvements in people's lives. On a global scale, women cultivate almost half of all the food that is grown. In Africa women expend as much as 85% of their daily energy intake fetching water."

[Source: *In Search of Geography 11*, 2006.]

- (a) Why have women largely been ignored in terms of development processes? (3)
- (b) **List** some of the daily challenges women may be faced with, particularly in less developed communities. (6)
- (c) Since the 1970s there has been a move towards gender equality. Why is it important to have greater female representation on development committees? (6)

4.1.4 Study the development indicators in the table below.

Table 1: Development Indicators from selected countries.

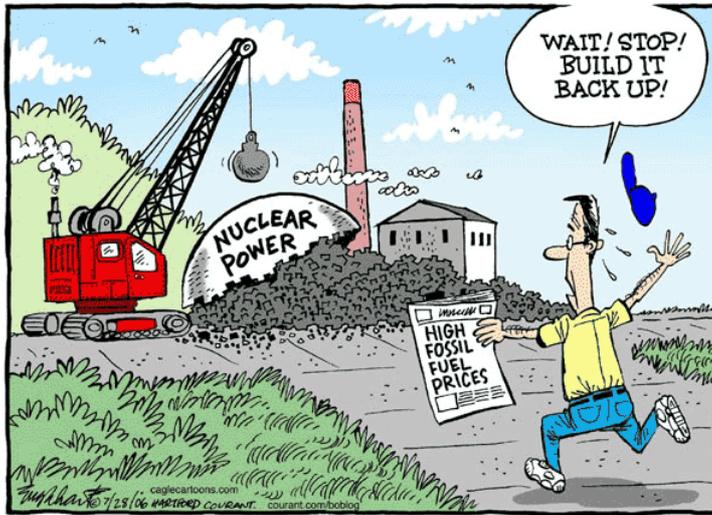
Country	GDP/Capita (US \$)	Life Expectancy	Literacy (% of total population)	HDI
Australia	32 900	80.62	100	0.946
Bangladesh	2 200	62.84	43	0.509
Brazil	8600	72.24	86.4	0.775
Burkina Faso	1300	49.21	26.6	0.302
United States	43 500	78	100	0.936

[Source: *CIA World Factbook*, 2007]

- (a) **Explain** what HDI refers to and how this index can be used as an appropriate development indicator. (3)
- (b) Life expectancy and Literacy values tell us a lot of information about the development status of a country. **Account for** the validity of this statement. (Refer to Table 1). (4)
- (c) **Compare** and **contrast** a day in the life of an individual living in a country with a low HDI value, versus an individual living in a country with a high HDI value. Use examples where appropriate. (8)
- (d) The World Bank and UN are aid organisations. Based on the table above, which country/ies do you think need the support of these organisations? (4)
- (e) How could the World Bank and UN assist countries in need? **List** appropriate and relevant strategies. (8)

4.2 People and their needs

Refer to Cartoon 2.



[Source: <<http://cagle.msnbc.com/working>>, 2007]

4.2.1 Nuclear power is featured in Cartoon 2.

- (a) Is nuclear power a renewable or non-renewable resource? (2)
- (b) Briefly **explain** what the cartoon is illustrating. (6)

4.2.2 Global energy demands are on the increase, hence the search for alternative power sources. **Account for** this trend giving some examples of alternative energy sources. (5)

4.2.3 South Africa currently has one operational nuclear plant at Koeberg, whilst extensive research and money is being spent on the development of the Pebble Bed Modular Reactor (*PBMR*) – a smaller nuclear reactor that will hopefully produce huge amounts of power whilst generating considerably less nuclear waste.

South Africa is facing an energy crisis. Is nuclear power our only solution? Write an essay in which you:

- **Discuss** the advantages and disadvantages of nuclear power.
- **Outline** alternative, more sustainable forms of power that could be utilised in future years.

(15)

100 marks

OR

QUESTION 5**5.1 Development and Sustainability**

5.1.1 Select the most appropriate answer (A, B or C) for each of the statements below.

- (a) Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

A Conservation
B Sustainable
C Environmental (2)

- (b) Economically more powerful nations of the world.

A The South
B The North
C LEDCs (2)

- (c) An indicator of human development taking into account literacy rates, life expectancy and GDP values.

A MEDCs
B TNCs
C HDI (2)

- (d) Development aid from one government to another.

A Multinational
B World Bank
C Bilateral (2)

- (e) Large, profitable global organisations.

A Transnational corporations
B United Nations
C NGOs (2)

Cartoon 3: "Globalisation"



5.1.2 The above cartoon is entitled 'Globalisation'. **Explain** what you understand by the term 'globalisation'? (4)

5.1.3 How does the cartoon portray globalisation, and does it represent globalisation in a negative or positive light? **Provide** reasons for your response. (8)

5.1.4 The process of globalisation has resulted in many *winner*s and *loser*s along the way.

Write an essay in which you:

Discuss who the *winner*s and *loser*s of globalisation are. **Suggest** examples in your essay to support your views. (15)

Table 2: Poverty in rural South Africa.

<ul style="list-style-type: none"> • 70% of South Africa's poor live in rural areas • 70% of rural dwellers are poor • 22% of households lack secure access to the basic services of piped water, accommodation and energy • 5% of rural households report zero cash incomes • almost 1 million rural households lack access to arable land
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[Source: *Shackleton*, 2004]

Refer to the statistics in Table 2.

- 5.1.5 What do you understand by a rural area? (4)
- 5.1.6 The statistics in Table 2 suggest that poverty is more of a concern in rural areas. **Account for** this observation. (5)
- 5.1.7 (a) **Suggest** an appropriate sustainable development plan a rural community in South Africa could adopt in order to improve their living standards and quality of life. (6)
- (b) **List** FOUR strategies to suggest how urbanisation can be slowed/prevented. (4 x 2 = 8)

5.2 People and their Needs**Read the following quotations.**

"It has been said that war is the price of peace ... Angola and Sierra Leone have already paid too much. Let them live a better life."

Ambassador Juan Larrain, Chairman of the Monitoring Mechanism on sanctions against UNITA.

'Diamonds are forever', it is often said. But lives are not. We must spare people the ordeal of war, mutilations and death for the sake of conflict diamonds."

Martin Chungong Ayafor, Chairman of the Sierra Leone Panel of Experts

"As millions of displaced Angolans arrive back home after a devastating 27-year war, arguments over land ownership and access are on the rise, raising concerns over the potential for serious conflict."

Lief Ohlsson

5.2.1 The quotations make reference to the conflicts associated with natural resources.

- (a) Which two natural resources are referred to in the quotations? (4)
- (b) **Classify** each of these resources as renewable or non-renewable. (4)
- (c) One of the quotations refers to '*conflict diamonds*'. What do you understand by this term? (4)
- (d) **Identify** FOUR other resources in Africa which may result in future conflicts. (4 x 2 = 8)

5.2.2 Conflicts over resources have an enormous impact on humans; however, the environmental impacts also take their toll.

- (a) **Explain** how the environment might also be affected by resource conflict, particularly within Africa. (6)
- (b) **Propose** solutions that would benefit both the environment and people living within Africa. (6)

5.2.3 In your opinion, are resource conflicts likely to increase or decrease in future? **Discuss** using relevant examples. (8)

100 marks

Total: 300 marks

GLOSSARY OF TERMS USED IN THE EXAMINATION PAPER

WORD	MEANING
Account for	To give reasons for a particular observation, occurrence or point of view
Calculate	Work out using mathematical formula
Classify	To divide into groups or types so that things with similar characteristics are in the same group
Compare and Contrast	To identify similarities and differences
Compile	To put together
Describe	To list the main characteristics of something; to give an account of (A diagram may be included as part of a description, provided that it is labelled)
Discuss	In paragraph format, to provide reasons and an analysis of an issue, occurrence, observation
Draw	To draw a diagram using labels
Explain	To make clear or plain or make sure that reader understands what is being said
Flow Chart	A number of ideas which are linked together by means of a process
Identify	To give the essential characteristics of ...
Indicate	To give
List	To present a number of facts, aspects or items
Match	To link up similar concepts or terms
Mindmap	A number of ideas, details which are linked by a central theme or point
Name	To state something; to list; to give ; to identify; to mention
Outline	To give the main features or general principles of a subject
Propose	To put forward an idea or strategy
Provide	To give/or name/state something
Suggest	To propose an explanation or a solution by way of plan or suggestion