HILLCREST HIGH SCHOOL
GRADE 10
GEOGRAPHY
DECEMBER 2014

TIME : 2 hours **MARKS** : 200

EXAMINER : Mr CM Girvin

INSTRUCTIONS

1. In Sections A and B you must answer all questions. In Sections C, D and E there is a choice of questions that is clearly marked.

2. Number your answers exactly as the questions are numbered

3. Write legibly!

4. Watch the time!

SECTION A – MULTIPLE CHOICE

In answering the questions in this section, you need only write down the question number and the letter of the most correct answer eg. 14. F. **DO NOT WRITE OUT THE WHOLE ANSWER – YOU WILL MERELY BE WASTING TIME**

1. If a person moves from Melmoth to Durban in search of a job, the migration is
   - A forced and regional
   - B voluntary and local
   - C voluntary and international
   - D forced and immigration

2. The _____ is the point that separates the crust and the mantle
   - A magma pool
   - B asthenosphere
   - C Moho discontinuity
   - D lithosphere

3. In South Africa, the _____ facing slope is always the warmest
   - A north
   - B south
   - C east
   - D west

4. The study of population is referred to as:
   - A geography
   - B demography
   - B biography
   - D musicology

5. The decrease in the population of rural areas is referred to as:
   - A migration
   - B immigration
   - C emigration
   - D depopulation

6. A parcel of air is capable of holding 120 g/cm³ of water vapour. It is currently holding 90 g/cm³. The relative humidity is thus:
   - A 0,5%
   - B 50%
   - B 75%
   - D 100%

7. Country A has a birth rate of 24/100 and a death rate of 12/100. The natural increase is thus

A 0,12% B 1,2%
C 12% D 120%

8. The terms Gondwanaland and Laurasia were first introduced by:

A Arthur Holmes B Alex du Toit
C Alfred Wegener D Barack Obama

9. The Russian Federation has a dependency ratio of 76. This means that:

A the dependency ratio is balanced
B for every 100 people who work, 76 people depend on them
C for every 76 people who work, 100 people depend on them
D an epidemic that affected only working people occurred in the Russian Federation at one time

10. If 50 000 people live in an area of 10 000 km², the population density is:

A 50 people/ km² B 0,2 people/km²
C 5 people/ km² D 20 people/ km²

11. The change in temperature with height is termed:

A lapse rate B isothermal layer
C inversion layer D height above sea level

2 X 12 = [24]

SECTION B – MATCHING COLUMNS

In this question, you must match a statement in Column A with a term in Column B. Once again, you just need to write down the question number and the letter corresponding to the correct answer eg. 16 A. **DO NOT REWRITE THE STATEMENTS**

COLUMN A	COLUMN B	
1. A type of mineral	A	Isostasy
2. The point on the earth's surface where a volcanic eruption occurs	B	Life Expectancy
3. Occurs when the relative humidity of the air is 100%	C	Shield
4. The average number of years that a person can expect to live	D	Trench
5. A very large volcanic crater	E	Thermosphere
6. An increasing percentage of people living in urban areas	F	Dependency Ratio
7. A state of balance in the earth's crust	G	Stratus
8. The average number of children borne by women in a country	H	Quartz
9. High clouds that are wispy	I	Saturation
10. A line on a map that joins all places of the same rainfall	J	Fertility rate
12. Occurs when two tectonic plates converge	K	Isohyet

13. The highest layer of the atmosphere	L	Subduction zone
14. The name given to the geologically stable centre of continents	M	Urbanisation
15. Expresses the economically active population relative to the economically inactive population	N	Central point
	O	Vent
	P	Caldera
	Q	Push and Pull
	R	Rural - urban migration
	S	Cirrus

2 X 15 = [30]

SECTION C : CLIMATOLOGY

1. FACTORS AFFECTING TEMPERATURE

Refer to the map of South Africa and the table below and then answer the questions that follow

City/town	Average daily temp – January	Average daily temp – July
Durban	High 28° C Low 21° C	High 23° C Low 11° C
Johannesburg	High 26° C Low 15° C	High 17° C Low 4° C
Cape Town	High 26° C Low 16° C	High 18° C Low 7° C
Polokwane	High 28° C Low 17° C	High 20° C Low 4° C

1.1 List **TWO** factors that would explain why Cape Town's average daily temperatures are lower than Durban's (2)

1.2 Choose **EITHER** of these factors (1.1) and explain why it causes the temperature difference between the two cities (4)

1.3 Distance from the ocean is another factor that can cause temperatures to differ

1.3.1 How does distance from the ocean affect temperature? (2)

1.3.2 Select evidence from the table above to prove this effect (4)

1.4 How would the average daily **HIGH** temperatures for **JANUARY** in the above table have been calculated? (3)

1.5 Using the figures in the above table, calculate the **AVERAGE DAILY TEMPERATURE RANGE** for

1.5.1 Durban in January

1.5.2 Polokwane in July (4)

1.6 A Durban family travels to Lesotho in the July school holidays to climb Southern Africa's highest mountain, Thabana Ntlenyana which is just over 3400m above sea level. The temperature when they left Durban was 21°.

1.6.1 At what rate would temperature have decreased as the family travelled (first by car and then on foot) from Durban to the top of Thabana Ntlenyana? (1)

1.6.2 What **TERM** is used to describe this rate of temperature decrease? (2)

1.6.3 Calculate the temperatures the family would have experienced at

(a) Pietermaritzburg (600m above sea level)

(b) Estcourt (1200m above sea level)

(c) the top of the mountain (6)

[28]

ANSWER QUESTION 2 OR QUESTION 3

EITHER

2.1 MOISTURE IN THE ATMOSPHERE

Place the following phrases in the correct order to answer the question 'why does it rain?' **ONLY WRITE DOWN THE LETTERS** which correspond to the phrases **IN THE CORRECT ORDER**

(a) rising air cools

(b) further cooling results in condensation

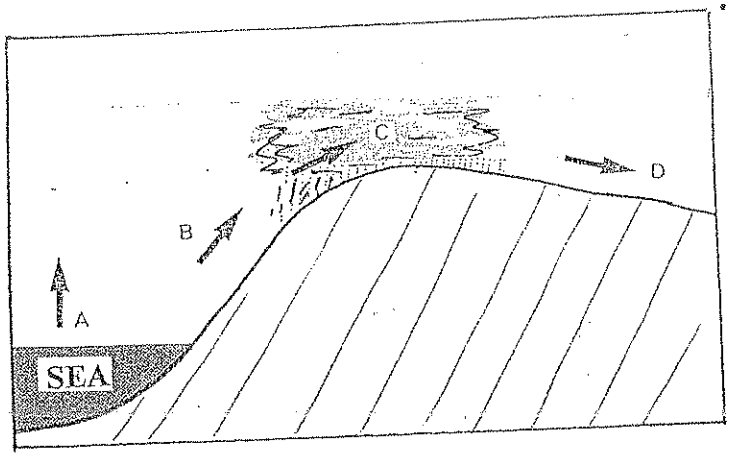
(c) warm air and water vapour are forced to rise

(d) insolation causes water in the sea and in lakes to evaporate

(e) relative humidity increases

(f) dew point temperature is reached (6)

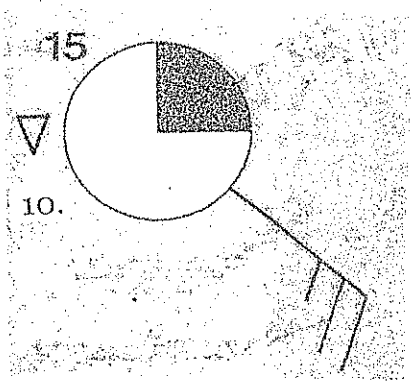
2.2 Refer to the sketch below and then answer the questions that follow



2.2.1 Provide suitable labels for A, B, C and D. Choose your labels from the following list:
leeward side ; cirrus cloud ; upside ; windward side ; condensation ; evaporation ; cumulus cloud (4)

2.2.2 At what **RATE** will temperature change at B? (1)

2.2.3 The following weather conditions are being experienced at C



Describe these weather conditions (6)

2.2.4 What **TYPE** of rainfall will occur at C? (1)

2.2.5.1 Name **ONE** other **TYPE** of rainfall (1)

2.2.5.2 Briefly describe how this type of rainfall forms (3)
[22]

OR

3. CLIMATE CHANGE

Read through the two case studies below and then answer the questions that follow

Case study: NASA: Global warming: 2009 ends warmest decade on record

Except for a levelling off between the 1940s and 1970s, Earth's surface temperatures have increased since 1880. The last decade has brought temperatures to the highest levels ever recorded, and the last year of the decade (2009) was tied for the second warmest year in the modern record, a new NASA analysis of global surface temperature shows. The analysis, conducted by the Goddard Institute for Space Studies (GISS) in New York City, was based on temperatures recorded at weather stations around the world and satellite data over the oceans.

Case Study: NASA examines Arctic sea ice changes leading to record low in 2007

12 October 2007

A new NASA-led study found a 23% loss in the extent of the Arctic's thick, year-round sea ice cover during the past two winters. This drastic reduction of perennial winter sea ice is the main cause of this summer's fastest-ever sea ice retreat on record and subsequent smallest-ever extent of total Arctic coverage.

3.1 Explain the difference between the terms **GREENHOUSE EFFECT** and **GLOBAL WARMING** (4)

3.2 Which of these two terms (3.1) is referred to in the first case study? (2)

3.3 Refer to Case Study 2

3.3.1 In which hemisphere is the Arctic? (1)

3.3.2 How much of the Arctic's sea ice cover was lost between 2005 and 2006? (1)

3.3.3 **EXPLAIN ONE** effect of this reduction of ice cover on
(a) the Arctic (3)
(b) the rest of the world (3)

3.4 Emissions of greenhouse gases are largely responsible for the loss of Arctic sea ice cover

3.4.1 Give **ONE** example of a greenhouse gas (2)

3.4.2 Name **ONE** source of greenhouse gas emission (2)

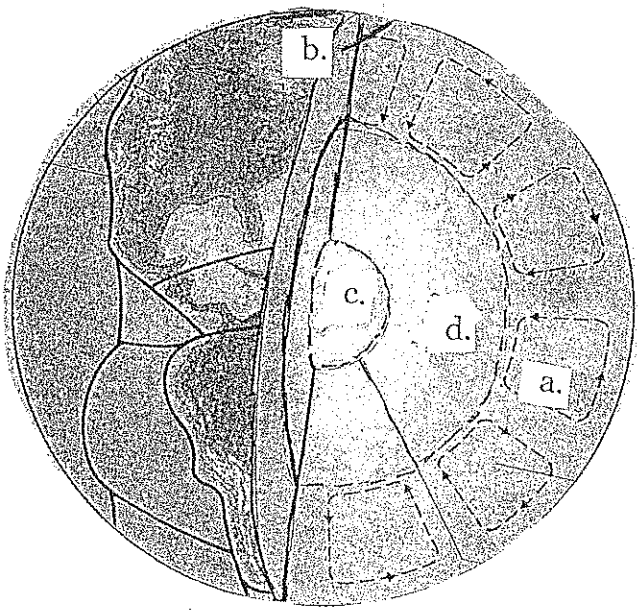
3.4.3 Describe how the emission of greenhouses gases ultimately causes the polar ice caps to melt (4)
[22]

TOTAL SECTION C : 50

SECTION D : GEOMORPHOLOGY

1. THE STRUCTURE OF THE EARTH

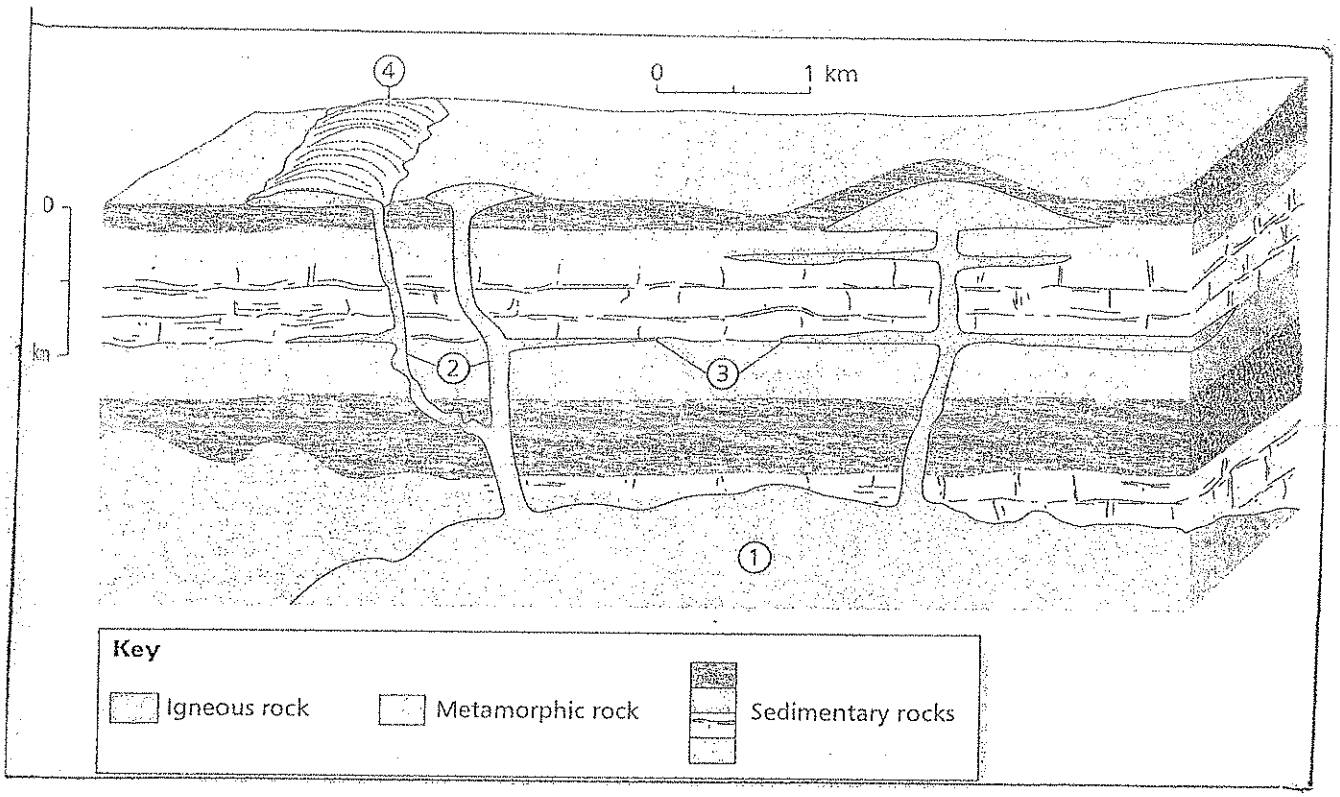
Refer to the sketch below and then answer the question that follows



Name the zones labelled a, b, c and d which make up the structure of the earth [4]

2. TYPES OF ROCKS

The diagram below represents a side view of the earth's crust



2.1 Name the igneous intrusions labelled 1, 2 and 3 (3)

2.2 Explain **ONE** important difference between the igneous rocks found at 1 and at 4 (4)

2.3 Sedimentary rocks can form in three ways

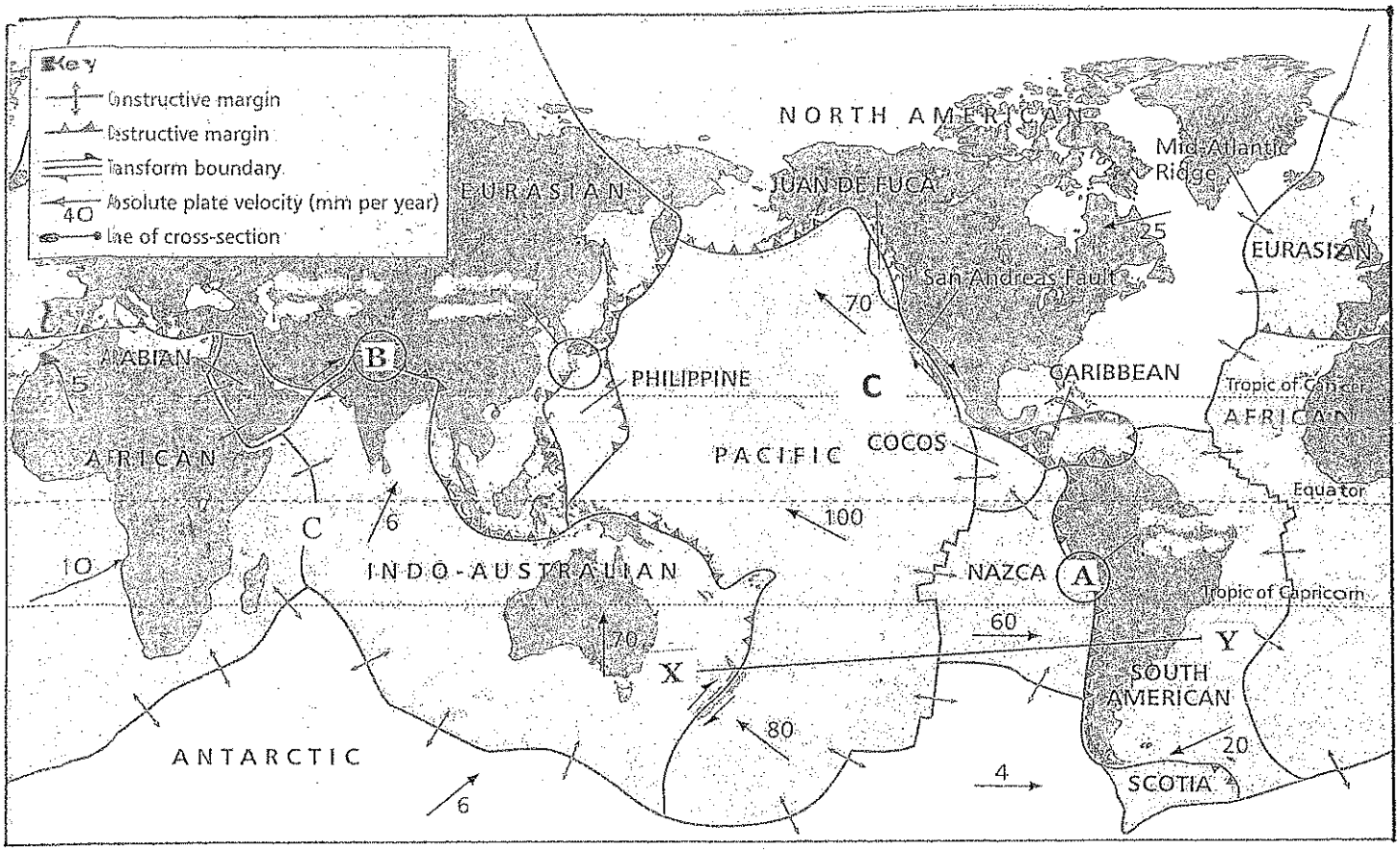
2.3.1 In which of these ways would the sedimentary rocks in this diagram have formed (1)

2.3.2 Briefly explain the process by which they would have formed (3)

[11]

3.CONTINENTAL DRIFT

The diagram below shows the global distribution of tectonic plates



The diagram on the attached sheet shows a cross section between X (New Zealand) and Y (a point in the South Atlantic Ocean) on the map. You **MUST HAND THIS SHEET IN**

3.1 What theory does the diagram above show? (1)

3.2 Mark in the following on the cross section on the attached sheet
(a) the Nazca Plate
(b) the Indo - Australian Plate
(c) the Pacific Plate
(d) the South American plate
(e) a trench
(f) the mid - oceanic ridge (6)

3.3 With reference to the map, explain why
3.3.1 the plate margin at A is said to be destructive
3.3.2 the plate margin at B is constructive (4)

3.4 With reference to the map, suggest why
3.4.1 an earthquake could occur at C
3.4.2 volcanic activity could occur at A (4)
[15]

ANSWER QUESTION 4 OR QUESTION 5

EITHER

4. EARTHQUAKES

Read the two case studies of earthquakes in Haiti and Japan below and then answer the questions that follow

Case study: Haiti, 12 January 2010

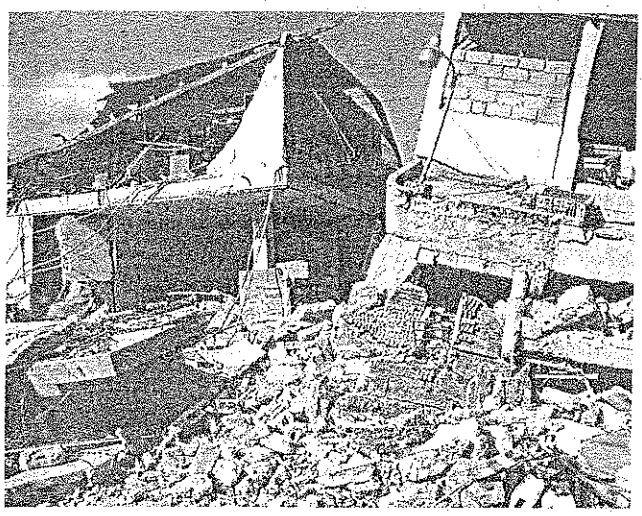


Figure 3.104 Damage caused to buildings in the Haitian capital Port-au-Prince.

The Haiti earthquake occurred at a fault that runs right through Haiti and is situated along the boundary between the Caribbean and North American plates. The depth of this earthquake was very shallow. Earthquakes of this nature are usually violent. This was a 7.0 earthquake.

"Unfortunately, Haiti has a rather poor economy and not a wonderful building style for earthquake resistance, so we would expect that we would see quite severe and widespread damage from this earthquake," said Michael Blanpeid, of the USGS Earthquake Hazards Program.

Earthquake engineers suggested that the buildings and homes were probably not reinforced with steel as building codes dictate, and this added to the earthquake damage, especially in more rural areas (adapted from http://www.msnbc.msn.com/id/34842469/ns/technology_and_science-science/)

Case study: Tohoku, Japan, 11 March 2011

The photographs in Figures 3.105 and 3.106 show part of the north-east coast of Japan before and after the tsunami in March 2011.

Facts

- The Tohoku earthquake was 9,0
- The focus was 32 km below the surface, and the epicentre was 130 km offshore.
- The tsunami wave was 10 metres high.
- In some places the tsunami wave penetrated 10 km inland.
- The tsunami damaged a nuclear power plant and caused a serious radioactivity threat.
- At least 25 000 people were killed.

4.1 The Japanese case study makes reference to the **FOCUS** and **EPICENTRE** of the earthquake. Explain the difference between these two concepts (4)

4.2 The Haiti earthquake was a 7.0 whilst the Japanese quake was a 9.0.

4.2.1 On what scale were these earthquakes measured? (1)

4.2.2 How much stronger was the Japanese quake than the one in Haiti? (1)

4.2.3 How does the scale of the two earthquakes relate to the degree of destruction they caused? (4)

4.3 What reasons do engineers suggest caused the collapse of buildings in the Haiti earthquake? (4)

4.4 About 230 000 people died in the Haiti earthquake whilst only 25 000 people died in Japan, even though the Japanese quake was stronger. Suggest **THREE** reasons that might explain this difference (6)
[20]

OR

5 FOLDING AND FAULTING

5.1 Refer to the diagram on the attached diagram sheet showing different types of folds and then answer these questions

5.1.1 Name the types of fold labelled a, b, c and d (4)

5.1.2 Name the parts of the fold labelled 1 and 2 (2)

5.1.3 What **TWO** factors have resulted in the difference in the shape of these folds? (4)

5.2 Refer to the diagram on the diagram sheet showing different types of faults and then answer these questions

5.2.1 Label each of these faults (3)

5.2.2 Add arrows to each drawing to show how the land on either side of the fault moves (3)

5.2.3 Explain, with the aid of a diagram, how a **RIFT VALLEY** forms (4)
[20]

TOTAL SECTION D : 50

SECTION E : POPULATION GEOGRAPHY

1.POPULATION DISTRIBUTION AND DENSITY

Refer to the table below which shows population densities of selected countries and then answer the questions

Country	Population	Area (km²)	Density (people/km²)
Singapore	4 987 600	710	7 023
Japan	127 380 000	377 873	337
United Kingdom	62 041 708	243 610	255
Nigeria	154 729 000	923 768	167
China	1 340 760 000	9 640 821	139
South Africa	49 320 500	1 221 037	40
Brazil	193 849 755	8 514 877	23
Russia	141 927 297	17 098 242	8,3
Australia	22 510 408	7 682 300	2,9
Namibia	2 171 000	824 292	2,6

1.1 Explain the difference between the terms **POPULATION DENSITY** and **POPULATION DISTRIBUTION** (4)

1.2 What term is used to describe an area that is highly populated? (1)

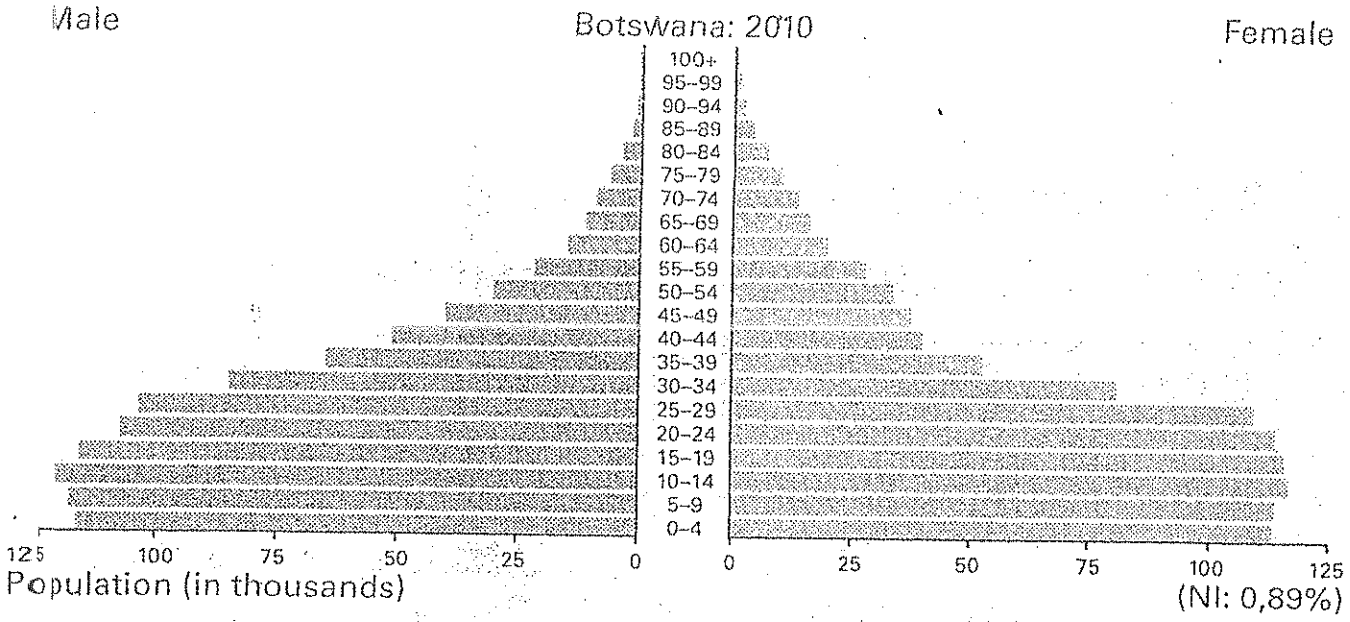
1.3 Singapore has the highest population density here but it does not have the biggest population. How can this be explained? (2)

1.4 Give a possible explanation for
(a) the high population density in a very large country, Nigeria
(b) the low population densities in Australia and Namibia, even though they are both very large countries 3 + 3 = (6)

[13]

2. POPULATION STRUCTURE

2.1 Refer to the population pyramid of Botswana below and then answer the questions that follow



2.1.1 What does a population pyramid show? (2)

2.1.2 Describe the shape of Botswana's population pyramid (2)

2.1.3 Give the number of
(a) males aged 10 - 14 and
(b) females aged 55 - 59 (2)

2.1.4 Which of the following statements best describes Botswana's population
A Rapid growth, expanding population?
B Slow growth, gradually expanding population?
C Stable, static population? (1)

2.1.5 Which gender in Botswana generally has a higher life expectancy? (1)

2.1.6 Give a possible reason for your answer in 2.1.5 (2)

4.1 Choose the word from the pairs below that describes the Jones migration
4.1.1 local/ regional/ international
4.1.2 voluntary/ forced
4.1.3 permanent/ temporary
4.1.4 emigration/ immigration from South Africa (4)

4.2 Factors that make people move are usually divided into two groups
4.2.1 What are these two groups of factors called? (2)

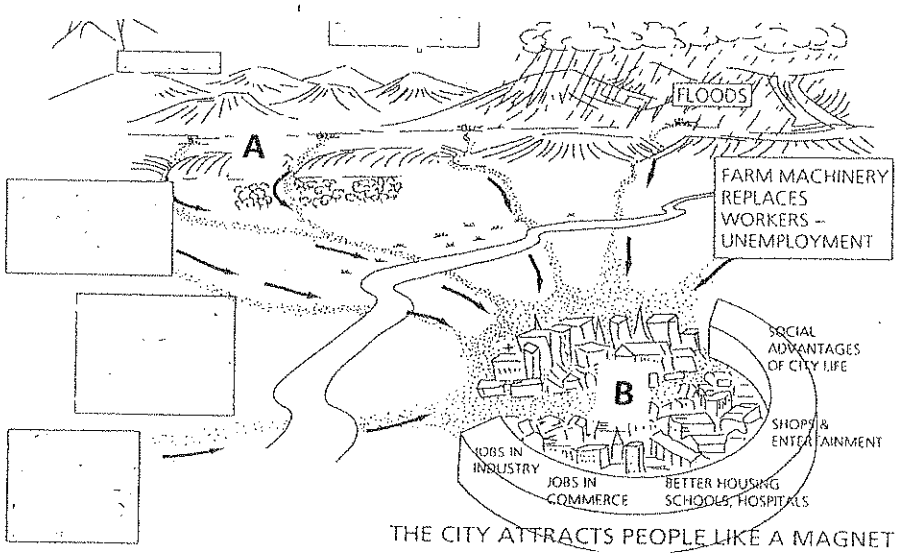
4.2.2 Give an example from **EACH** group that might have encouraged Mr Jones to move (4)

4.3 **EVALUATE** the effects of a migration such as the Jones' migration on a country like Australia. This means that you must describe the benefits of these migrations to Australia as well as the problems it causes (7)
[17]

OR

5. POPULATION MOVEMENTS

Refer to the diagram below and then answer the questions that follow



5.1 Choose the word from the pairs below which describes the migration represented in this diagram
5.1.1 local/ regional. international
5.1.2 forced/ voluntary
5.1.3 temporary/ permanent
5.1.4 urban to rural/ rural to urban (4)

5.2 Describe **FOUR** factors that may cause people to move from area A to area B (8)

5.3 Evaluate the effects of this movement of people on area B. This means you must describe the benefits of the migration to area B as well as the problems is causes (5)
[17]

TOTAL SECTION E : 50

EXAM TOTAL : 200

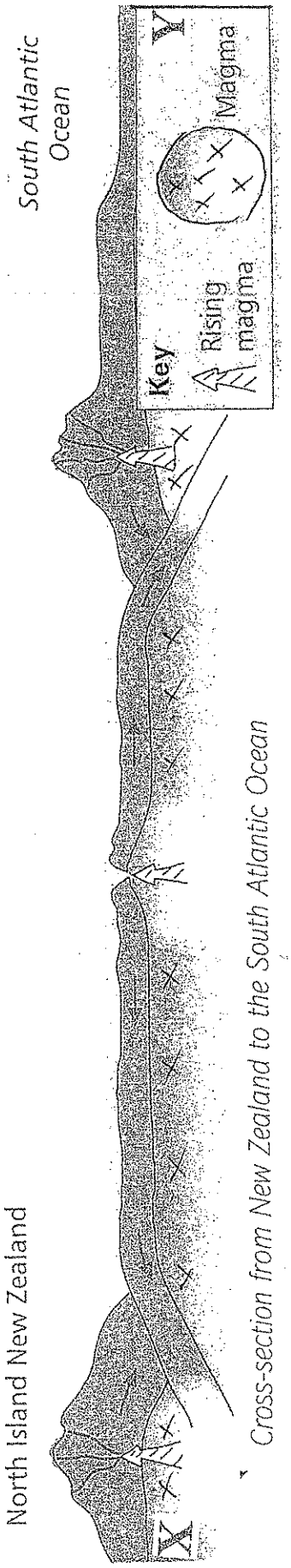
GRADE 10 GEOGRAPHY

DECEMBER 2014

DIAGRAM SHEET

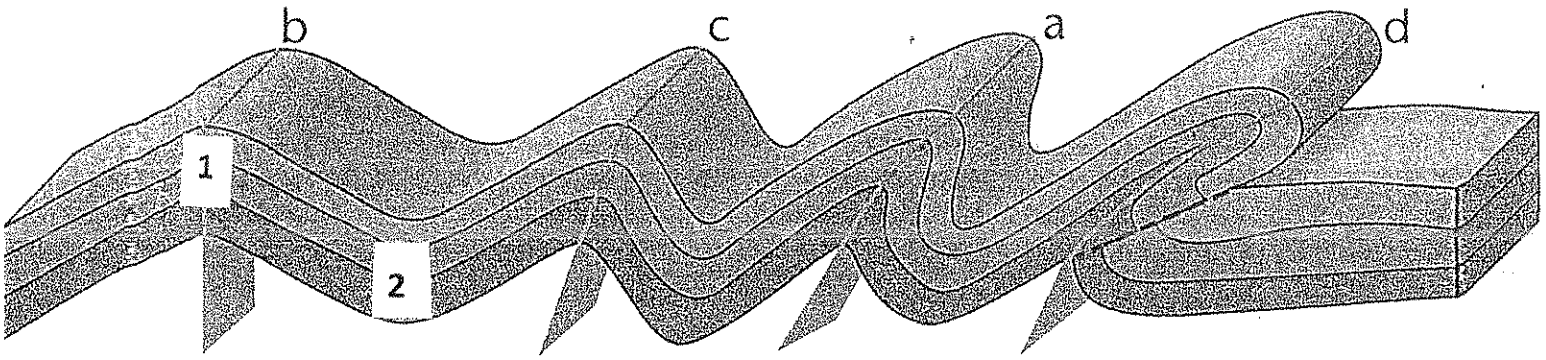
NAME _____

1. SECTION D - QUESTION 3



Cross-section from New Zealand to the South Atlantic Ocean

2.SECTION D - QUESTION 5.1



3. SECTION D - QUESTION 5.2