Grade 10 | Hillcrest High School | Marks: 190

Geography Paper 1 | November 2015 | Time: 2 Hours

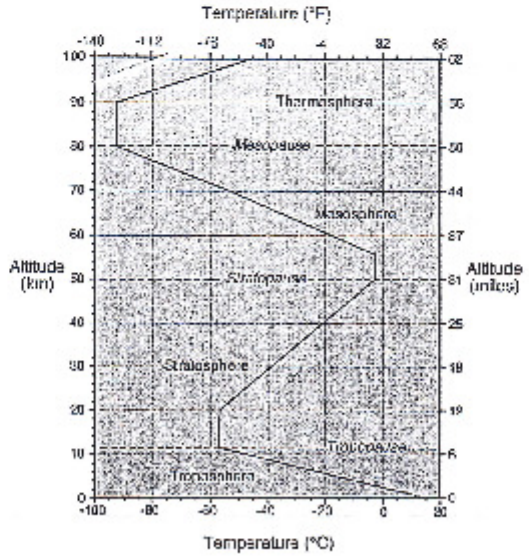
Examiner: C. Madeley

Instructions: 1. Attempt all questions.

2. Answer all the questions on the answer booklet provided
3. Write neatly and number your answers clearly.
4. Leave a line and rule off after each question.
5. There are three sections in this paper.
6. Read questions carefully.

Section A **Atmosphere weather and climate.**

Question One Study the temperature trace through the layers of the atmosphere represented below:



1.1 Name the two gases which occur in the greatest quantity in the troposphere. 2

1.2 Name a variable gas in the atmosphere. 1

1.3 What type of lapse rate is observed in the troposphere? Explain why this lapse rate occurs. 4

1.4 Name the main gas responsible for:

a. the negative lapse rate in the stratosphere.

b. the greenhouse effect 2

1.5 Both scattering and absorption of longwave radiation takes place in the troposphere and the stratosphere.

a. Explain what causes scattering of radiation. 3

b. Why is absorption of radiation important? 2

1.6 Conduction and convection are both important in heating of the atmosphere. Briefly differentiate between the two processes. You may use a simple sketch to aid in your description. 4

[18]

Question Two **Multiple choice**

Write only the number of the question and the letter of the correct answer for each of the options below.

1.1 The different wavelengths of radiant energy that pass through the atmosphere is called:

A) wavelengths

B) the electromagnetic spectrum

C) visible light

D) a rainbow

1.2. an average lapse rate of 0,65 degrees Celsius per 100m is called:

A) dry adiabatic lapse rate

B) wet adiabatic lapse rate

C) environmental lapse rate

D) normal lapse rate

1.3. The two environmental conditions required for rainfall to occur are:

A) precipitation and evaporation

B) condensation and saturation

C) evaporation and dew point

D) humidity and condensation

1.4 The relative humidity of air can be gauged by comparing:

A) air temperature and dew point temperature

B) ground temperature to air temperature

C) lapse rates

D) air pressure to temperature

1.5 Atmospheric pressure is:

A) the force exerted by the atmosphere on the earth's surface

B) the amount of air above the earth

C) the upward movement of air

D) Lowest at sea level.

1.6 Atmospheric pressure is measured with a:

A) hygrometer

B) barometer

C) anemometer

D) wind vane

1.7 The names of Clouds that from near the top of the troposphere have the prefix _____ affixed to their names.

A) cumulo-

B) strato-

C) cirro-

D) alto-

1.8 The ocean current causing lower rainfall and cooler temperatures along South Africa's coastline is the:

A) Benguella

B) Mozambique

C) West wind drift

D) West coast current

1.9 Thunderstorms are caused mainly by:

A) convection currents caused by heating

B) Cold, stable air

C) air being lifted over mountain ranges

D) dry air mixing with wet air

1.10 The region of the year with the greatest heat surplus is:

A) The temperate regions

B) The Sub polar regions

C) the tropics and sub tropics

D) the polar regions (10)

Question Three

Study the climographs for Austin, Texas and Eureka California in North America (see pg 5 & 6)

3.1 What evidence is there that these towns are in the Northern hemisphere? (2)

3.2 Calculate the temperature range for:

a. Eureka

b. Austin (2)

3.3 Comment on the temperature range for these two places Account fully for any differences. (6)

3.4 Which place is cooler on average? Explain a possible reason for this from the information presented here. (5)

3.5 Which place could be described as experiencing a continental climate? (1)

3.6 Which city /town experiences seasonal rainfall? Explain your answer. (2)

3.7 Refer to the climograph for Missoula, Montana. Suggest two reasons why snow is likely to occur in this area during winter. (4)

3.8 Calculate the average summer rainfall in Missoula. (2)

3.9 Assume you wanted to buy a property in Missoula that is not too cold in winter and spring. Describe how you would apply the concept of aspect in choosing the right property. (4)

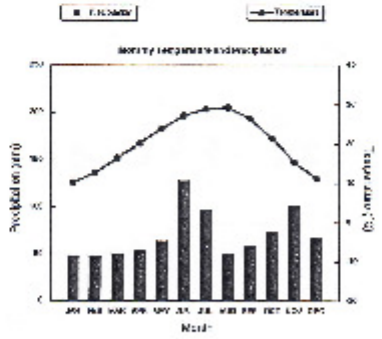
3.10 Why when choosing a property should you not choose a valley floor for its location? Suggest two reasons. (4)

3.11 What is a temperature inversion? You may sketch to aid your answer. (4)

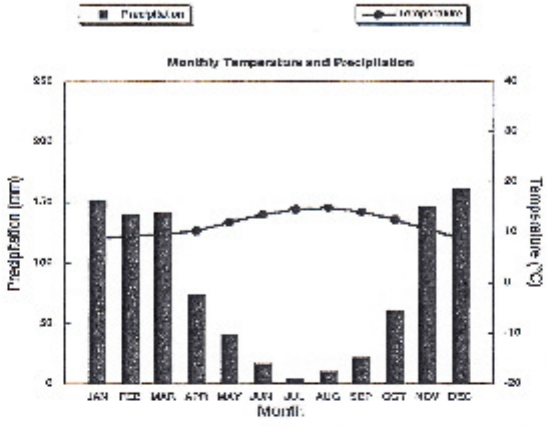
[36]

Annual Climatology: Austin, TX (ATT)

Elev: 189.3 m Lat: 30° 18'N Long: 97° 42'W

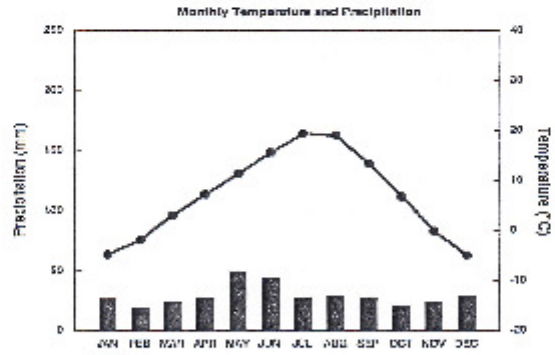


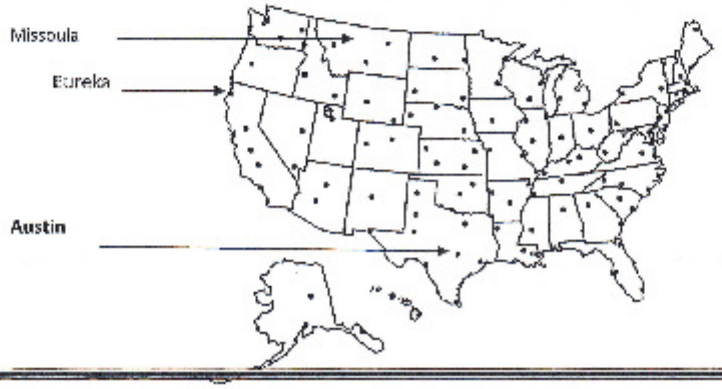
Annual Climatology: Eureka, CA (EKA) Elev.6.1m
Lat: 40° 49'N Long: 124° 13'W



Climatology: Missoula, MT (MSO)

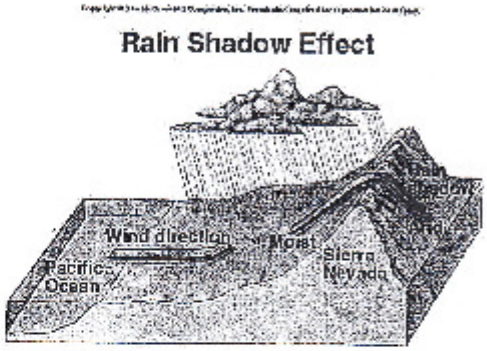
Elev: 972.9 M Lat: 46° 55'N Long: 114° 06'W





Question Four.

The following diagram represents the effect that the Sierra Nevada mountain range has on the western coast of North America with respect to rainfall. Refer to it for the following questions.



4.1 What type of rainfall is represented here? (2)

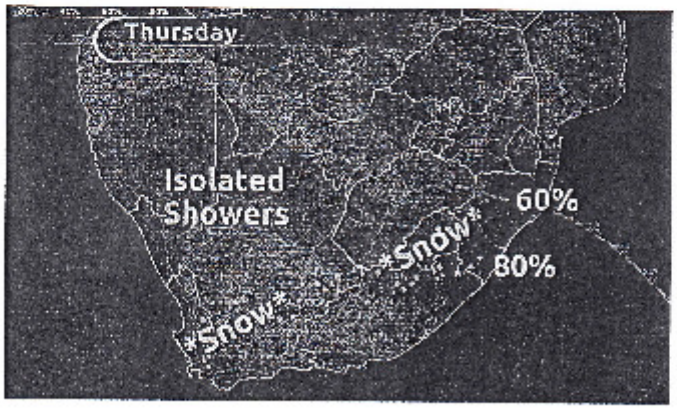
4.2 a. Define the term rain shadow. (2)

b. Explain why the rain shadow occurs. (4)

4.3 State where the leeward and windward side of this mountain range is. (2)

[10]

5. Refer to the sketch below showing a typical front moving over South Africa.



5.1 What is a front? (1)

5.2 What type of front is this? (1)

5.3 Explain with the aid of a sketch how this system causes rain and cold conditions. (4)

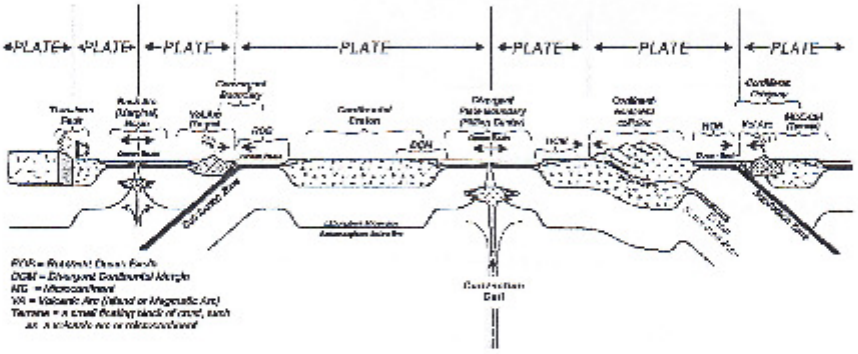
5.4 During which season do these fronts more frequently affect our weather? (2)

[8]

Total Section A: 82 marks

Section B Geomorphology

Question One **Study the following representation of plate tectonics carefully.**



1.1 What is meant by the term plate on this diagram? (2)

1.2 What <u>type</u> of rock is likely to form on the surface at a subduction zone?

Explain why. (3)

1.3 Sediments accumulate on the ocean basins on the sketch. What rock type will result from this process? Name two example of this type of rock. (4)

1.4 Explain the term <u>divergent plate boundary</u> with reference to the sketch. Mention what causes it. (4)

1.5 <u>Refer to the transform fault represented here</u>.

a. define "fault" (2)

b. why are earthquakes likely to occur in this region? (4)

c. Name a country that experiences earthquakes in the pacific region. (2)

d. Describe three measures that have been out in place to deal with the threat of earthquakes and tsunamis in the pacific region. (6)

e. Describe one piece of evidence that researchers such as Wegener and others such as Du Toit found to suggest that continents are not stable static pieces of the earth but are in fact moving. (3)

[30]

Question Two **Multiple choice**

Write the number of the question and the letter matching the correct answer in each case.

2.1 Folding is a result of:

A) exogenic forces

B) compression forces

C) tension forces

D) continental drift

2.2 The Himalayas mountains in Asia are a result of :

A) Continental crust colliding with ocean crust

B) A massive volcanic eruption

C) faulting

D) erosion of an ancient land surface

2.3 Quartzite and marble are both examples of:

A) Igneous rock

B) Plutonic rock

C) Metamorphic rock

D) Sedimentary rock

2.4 The Great Rift Valley in Africa was caused by:

A) Sinking of the land between parallel faults

B) Subduction

C) Volcanic eruptions

D) Numerous earthquakes

2.5 When magma intrudes into the earth's crust and causes a large dome shaped structure it results in a :

A) Sill

B) Dyke

C) Batholith

D) Volcanic pipe

2.6 The Drakensberg in south Africa is an example of :

A) A Plateau

B) Fold mountains

C) An Escarpment

D) Ridges and valleys

2.7 The giant continent which made up today's continents approx. 300million years ago is referred to as:

A) Gondwanaland

B) Laurasia

C) Pangaea

D) Tethys

2.8 The focus of an earthquake is found:

A) At the source of the earthquake beneath the surface

B) On the surface above where the earthquake occurs

C) Along a main fault line

D) Where the seismic waves occur

2.9 Volcanoes derive their energy from:

A) The earth's core

B) The mantle

C) The crust

D) The sima

2.10 the following are features of extrusive volcanism:

A) lava dome and lava flow

B) dyke and laccolith

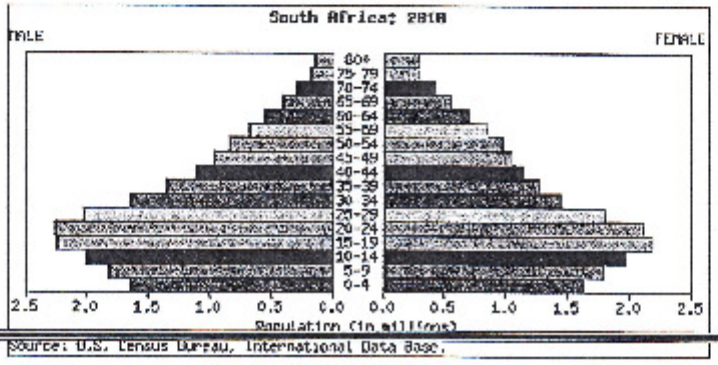
C) Sill and pipe

D) Cone and lopolith (10)

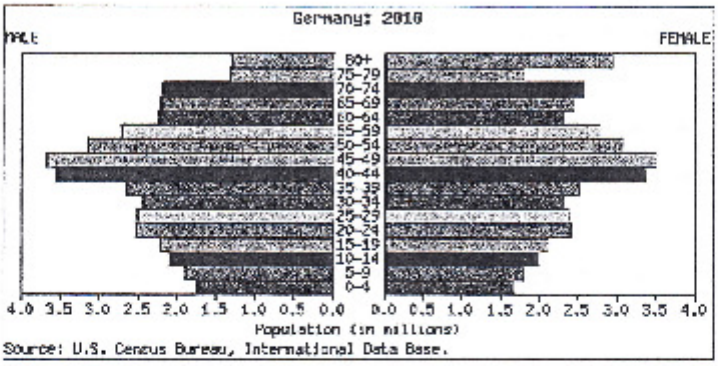
Section C **Population studies**

Question One Study the population pyramids for South Africa and Germany in 2010.

Source: US census bureau



Source: U.S. Census Bureau, International Data Base.



1.1 What is the main function of a population pyramid? (2)

1.2 Calculate: the total number of children under the age of 10 in both Germany and South Africa. (2)

b. What does this indicate about crude birth rates in Germany and South Africa? (2)

c. Suggest two reasons for your answer to 1.2 b. (4)

b. Compare, with reasons the dependency ratio of the two countries? (4)

1.3 State which of the above countries fits into the following categories. In each case give evidence for your answer.

a. has the longest life expectancy

b. has the lowest natural increase

c. will have to increase social spending on pensions and health care in the near future (6)

1.4 Choose a word to describe Germany's population growth rate. Explain two reasons why it has reached this stage. (5)

1.5 Outline two challenges that this graph suggests South Africa will be facing in the near future. (4)

1.6 Indicate in which stage of the demographic transition model you would expect to find Germany and South Africa. (2)

[31]

Question Two Read the following extract from the Guradian newspaper and answer the questions that follow.

This will be remembered as the year when Europe experienced the biggest displacement of people since the second world war. As the latest report(published last Friday) by the International Organisation for Migration shows, a record 473,887 refugees have crossed the Mediterranean to Europe so far in 2015, including at least 182,000 Syrians – almost 40% of the total.

In just one week more than 30,000 refugees entered the EU's newest member state, Croatia. It happened after Hungary decided to build a metal fence on its southern border with Serbia. Unlike other countries, Croatia's centre-left government has done everything possible to avoid the refugee crisis becoming a security issue. (By contrast the conservative president, Kolinda Grabar Kitarović, has been invoking the need for "security" and "stability".)

All these terms, even if not deliberately intended to provoke, present the crisis as if it were a natural disaster: all of a sudden, out of the blue sky, waves of immigrants are penetrating into the heart of Europe.

But the refugee crisis is not a natural disaster. It has very concrete causes.

First of all, it hasn't just started. It began years ago. What countries such as Croatia, Serbia, Slovenia or Hungary are experiencing now is something that has been present for years in Greece, Macedonia and Italy, argues

The only reason the refugee crisis is now in the spotlight lies in a banal but brutal fact: it has penetrated from the periphery of Europe to the heart of the European Union.

Furthermore, the real causes go back much earlier than the war in Syria. Although it is being presented as a "natural disaster", this is a result of very concrete politics that can be traced back to the invasions of Afghanistan and Iraq.

Then came the so-called Arab spring; dictators such as Gaddafi and Mubarak, who had been allies of the west, were violently removed; millions of people found themselves in warzones and many of them started to migrate, of course – what else? Adapted from the Guardian online newspaper edition

2.1 What is meant by:

a. displaced people

b. refugee (2)

2.2 Describe three causes of political migration / refugees in our world today. (3)

2.3 What has caused the migration described in this article? [7]

2.4 Evaluate in a short paragraph of the effect that this migration will have on the countries in Europe to which the people are migrating. [6]

2.5 Describe an example of each of the following types of migration from South Africa:

a. economic migration

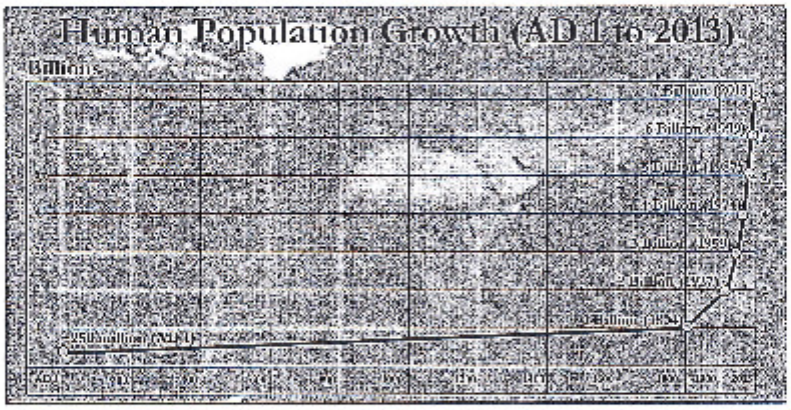
b. migrant labour [4]

2.6 South Africa also experiences large scale immigration-often illegal- from surrounding countries. Suggest two problems that a newly arrived migrant in South Africa faces. (4)

[21]

Question Three

3. Consider the graphic below showing the growth in human popoulation.



3.1 Explain two reasons for the pattern in growth between 1800 and 2000 (4)

3.2 What problem does this graph depict? [2]

3.3 Evaluate three effects of the problem you named in 3.3 on the earth's resources and people. Use actual examples and figures where you are able to in your answer. (6)

3.4 Suggest two strategies that South Africa could institute to curb rapid population growth. [4]

[16]