Grade 11 Marks: 180

Geography Paper 1 June 2019 Time: 2 hours

Examiner: CR Madeley

Moderator: P Ramsern

Instructions:

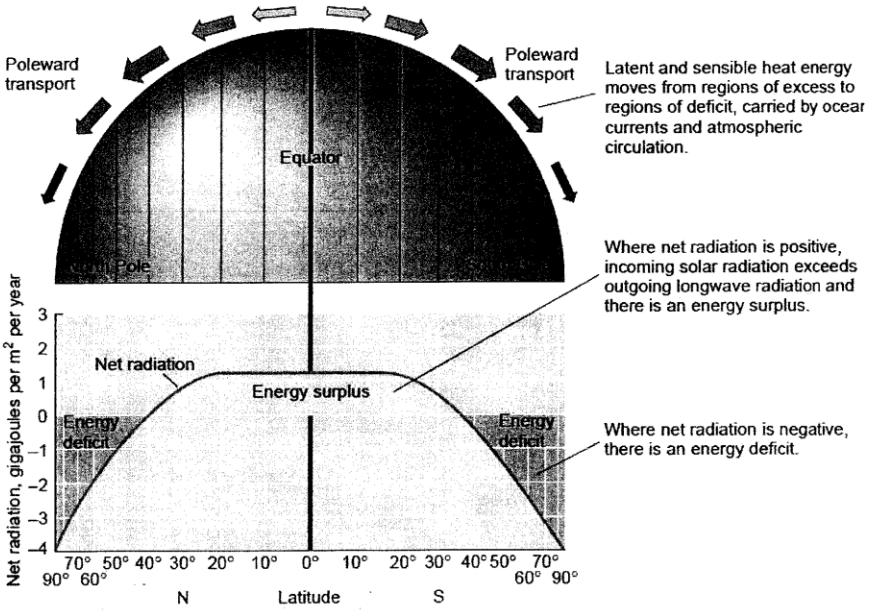
1. There are no choices in this paper. Attempt all questions.

2. Number your answers according to the question paper. Answer all questions in the answer booklet provided.

3. Manage your time. Do not spend too long on any particular question. 1, 5 marks per minute is allocated.

4. Ensure that you look carefully at sources before answering the question set.

Question One **Refer to the diagram below showing how the energy balance of the earth is maintained.**



2.19 Annual surface net radiation from pole to pole

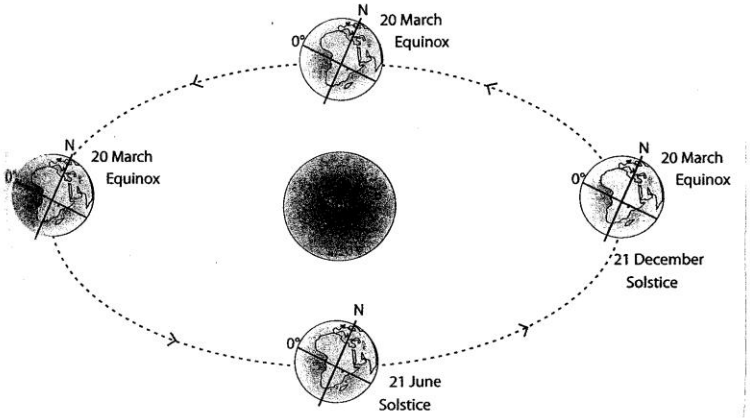
1.1 Name the two <u>mechanisms</u> by which energy is transferred around the earth. (2)

1.2 Describe the direction of movement of heat energy. State why it moves in this direction. (2)

1.3 Between which latitudes is there a **surplus** of energy? Explain why. (3)

1.4 Outline three different ways in which this distribution of energy affects earth's inhabitants. (6)

<u>1.5 Refer to the diagram below showing how seasonal variation affects the amount of radiation received at the earth's surface and answer the questions that follow.</u>



1.5.1 Briefly explain the cause of seasonal variations in radiation. (2x2=4)

1.5.2 <u>Refer to the 4 important dates shown above</u>.

a. State the conditions that occur during the equinoxes. State why these conditions occur. (2)

b. State where the noon sun is directly overhead on the 21st December. (1)

c. State the conditions that exist in the Southern hemisphere on the 21st June. (2)

1.5.3 Define the term **"thermal equator"**. Explain why it does not coincide exactly with the actual equator. (4)

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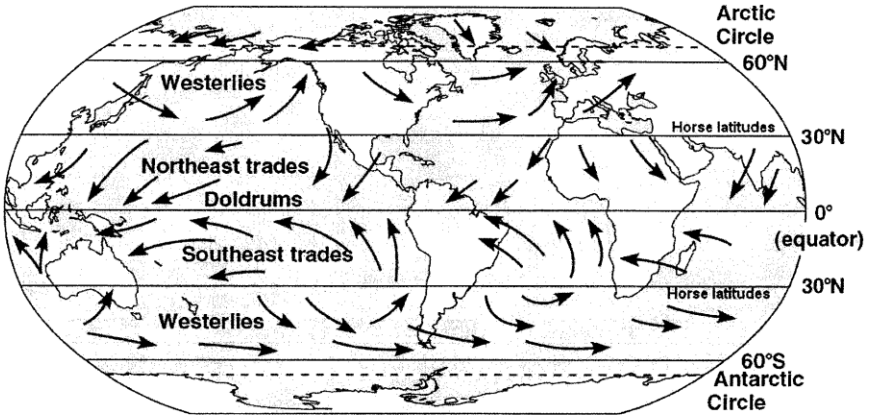
Question Two **Study the source below showing the location and direction of the *planetary winds* that form part of global air circulations.**



2.1 Explain how the following affect the *direction* of these planetary winds.

a. Pressure gradients

b. Coriolis force (4)

2.2 Which wind belt is associated with:

a. the El Nino southern oscillation

b. the movement of cold fronts (mid latitude cyclones) (2)

2.3 State the *latitudinal* position of the following circulation cells.

a. Tropical cell

b. mid latitude cell (2)

2.4 Explain what causes the polar front to occur at roughly 60 degrees. (2x2=4)

2.5 Describe the formation of:

a. the doldrums (2)

b. the westerlies. (4)

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Question Three **Read the following extract and answer the questions based on it.**

Foehn winds (sometimes written "Föhn") are common in mountainous regions, regularly impacting the lives of their residents and influencing weather conditions for hundreds of kilometres downwind.

On 14 - 15 January 1972 in Montana, USA, a foehn chinook event was responsible for the greatest temperature change over a 24 hour period ever recorded in the United States: according to the US National Weather Service the temperature rose a staggering 57 °C; from -48 to 9 °C.

In the UK, the most notable foehn events tend to occur across the Scottish Highlands where the moist prevailing westerly winds encounter high ground along Scotland's west coast. This results in a marked contrast in weather conditions across the country with the west being subjected to wet weather, whilst the lower lying east enjoys the warmth and sunshine of the foehn effect.

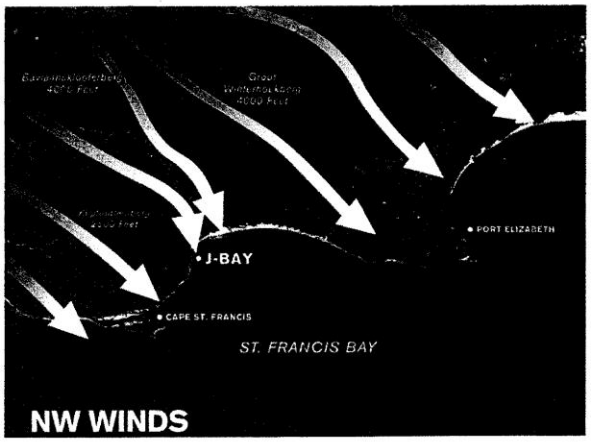
3.1 Explain why Foehn winds are common in mountainous regions. (2)

3.2 Name the region and mountain range from which the term "Foehn" wind originated. (2)

3.3 Account for the weather conditions that occurred in Montana. You may use a diagram in your answer. (4)

3.4 Describe two impacts of Foehn winds on the human and natural environment of the areas that experience them. (4)

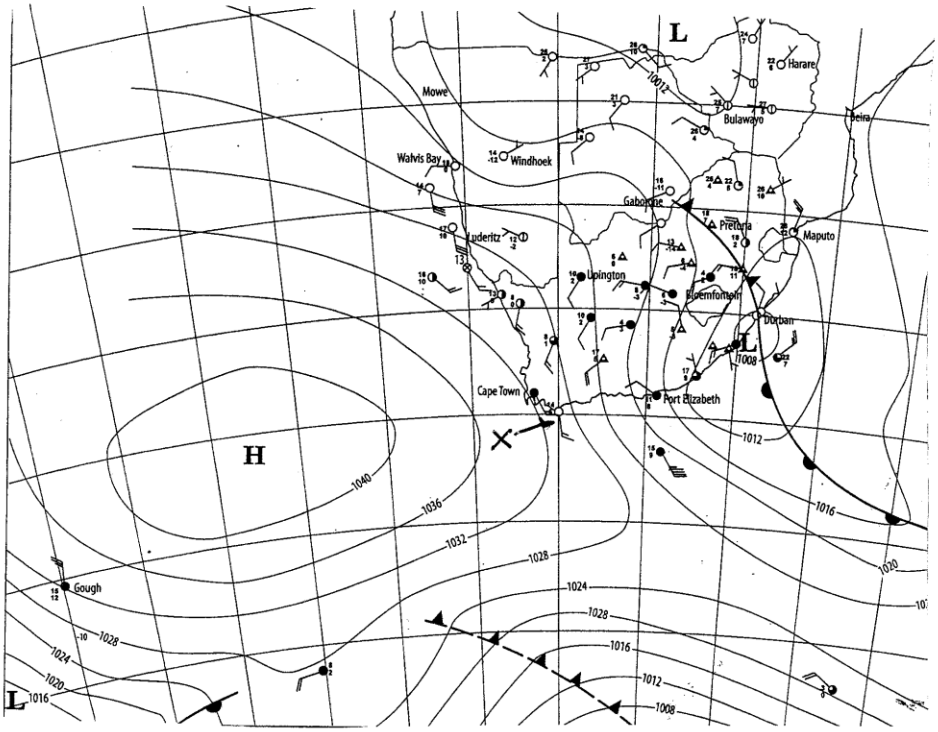
3.5 <u>The diagram below shows the movement of Berg winds along the Eastern Cape.</u>



3.5.1 State why these winds are termed *offshore* winds. (2)

3.5.2 Explain with reasons, three precautions that people living on the **leeward** side of the mountains- particularly farmers, should take when these winds are predicted. (3x2=6)

Question Four. Study the synoptic map for southern Africa below and answer the questions that follow.



4.1 Name the *anticyclone* to the west of Cape Town. (1)

4.2 State the direction of air movement around this cell. (1)

4.3 State the wind speed and direction at the weather station model labelled **X**. Give a reason for the wind direction here. (3)

4.4 A weather disturbance consisting of two fronts is situated over the east coast. Name this weather disturbance. (1)

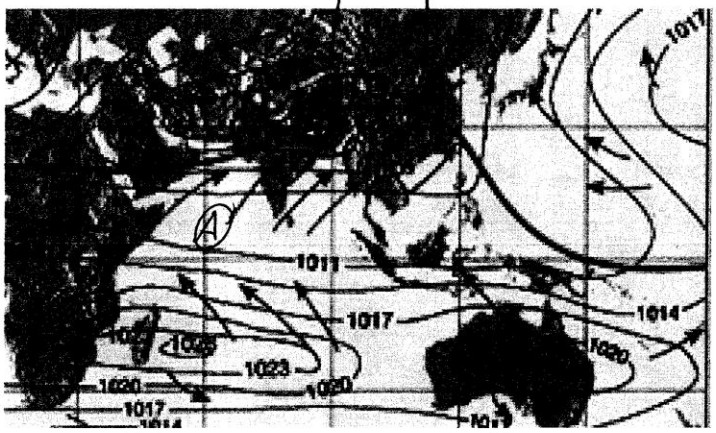
4.5 Account for the overcast conditions experienced over the interior plateau of south Africa. (2x2=4)

4.6 State two reasons from the map why this is a winter situation. (2)

4.7 How can you tell from the weather station model that the air at Windhoek is very dry? (2)

[14]

Question Five The image below shows the movement of air over the Asian subcontinent from the tropical Indian ocean during the summer monsoon.



Source: brown university department of geological sciences.

5.1 What is the ITCZ? (2)

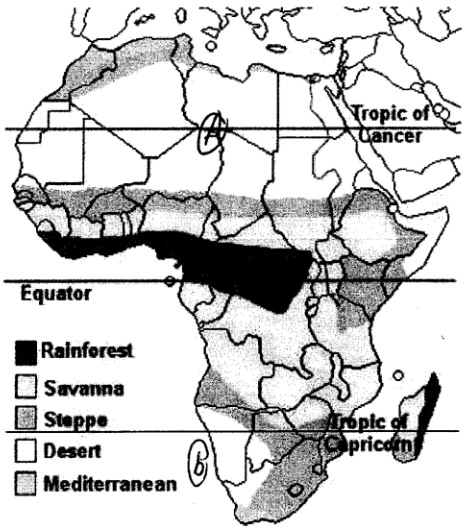
5.2 Name the lines plotting atmospheric pressure on this map. (2)

5.3 Describe the atmospheric pressure pattern between the Indian Ocean and the Asian land surface. Explain why this happens in summer. (4)

5.4 Describe and account for the weather conditions that will occur over those parts of southern Asia affected by the arrows showing the air movement. (3x2=6)

[14]

Question Six **Refer to the map below showing climatic regions across Africa.**



6.1 Name two factors, apart from latitude, that affect the climate of the different regions shown. (2)

6.2 Account for the year-round high rainfall in the rainforest area of Africa. (2x2=4)

6.3 Explain the location of the desert regions in:

(a) North Africa.

(b) West coast of southern Africa. (2x2=4)

6.4 Describe the climatic conditions experienced in the Mediterranean climatic region. (2)

6.5 Desertification is a threat to the economic stability of southern African regions of the continent.

Evaluate this statement. (3x2=6)

[18]

Section B **Geomorphology.**

Question One **Physiographic regions of South Africa.**

1.1 Name each of the physiographic regions from the descriptions given below:

a. Steep land joining the interior plateau to the coastal plains.

b. Occurs between parallel ranges of Fold Mountains in the Western Cape

c. region characterised by mesas and flat plains

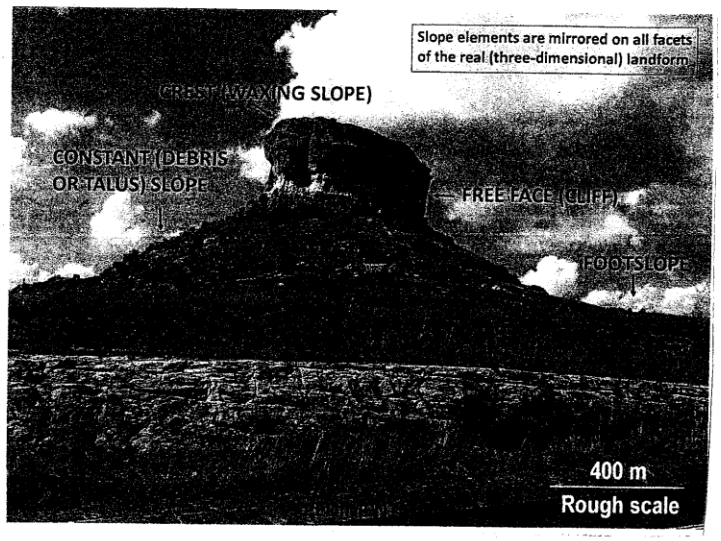
d. depression that occurs in the North West of the plateau.

e. mountainous region along the Western Cape and southern cape coast. (5)

1.2 Describe the main characteristics of the interior plateau. (2)

1.3 Describe two impacts of the Drakensberg escarpment on South Africa's climate and economy. (4)

Question Two **Study the photograph below showing a profile of a Butte landform in the Free State.**



2.1 State one piece of evidence that this feature formed in an area of horizontal strata. (2)

2.2 Explain why the free face is vertical. (2)

2.3 Describe how this landform formed from its original landscape. You may use a sketch to aid in your explanation. (3x2=6)

2.4 Explain the origin of the material that makes up the talus slope. (2)

2.5 State two uses of the pediment by people in this type of landscape. Explain your answer. (2x2=4)

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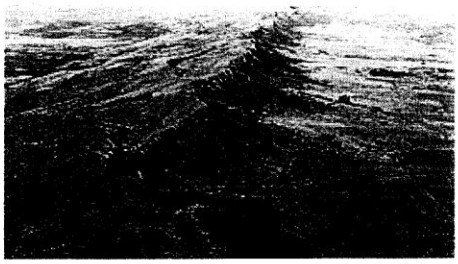
Question Three

Study the photograph and read the text below describing the Magaliesberg landscape in the North West province.

The Magaliesberg Range has a very long geological history. Its quartzites, shales, chert and dolomite were deposited as sediments in an inland basin on top of the 3 billion year old Archaean Basement Complex. This process of sedimentation lasted for about 300 million years. About 2 billion years ago, a massive upwelling of molten magma resulted in what is now known as the Bushveld Igneous Complex. The enormous weight of this intrusion depressed the sediments that lay beneath and tilted the sediments along the edges. *Source: Wikipedia.org*



3.1 Both sedimentary and igneous rocks are mentioned here. Name one example from the source of a sedimentary rock. (1)

3.2 Name the feature that forms when sediments are depressed over a wide area, as described. (2)

3.3 State the term that describes the tilted rock sediments described above. (2)

3.4 Draw a side profile of the landscape in the photograph and label:

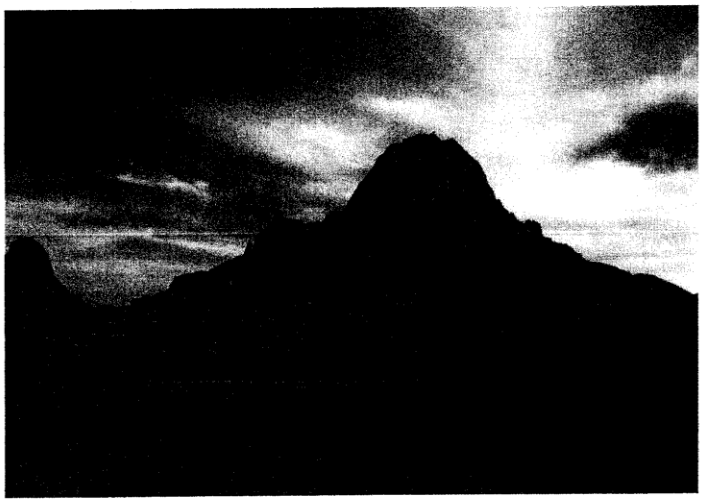
a. the scarp and dip slope

b. the direction in which *homoclinal shifting* occurs. (4)

3.5 Evaluate how this landscape may affect how people use it. (2x2=4)

[12]

Question Four **Refer to the photograph below showing a granite dome in Namibia. Locally known as Sptizkoppe.**



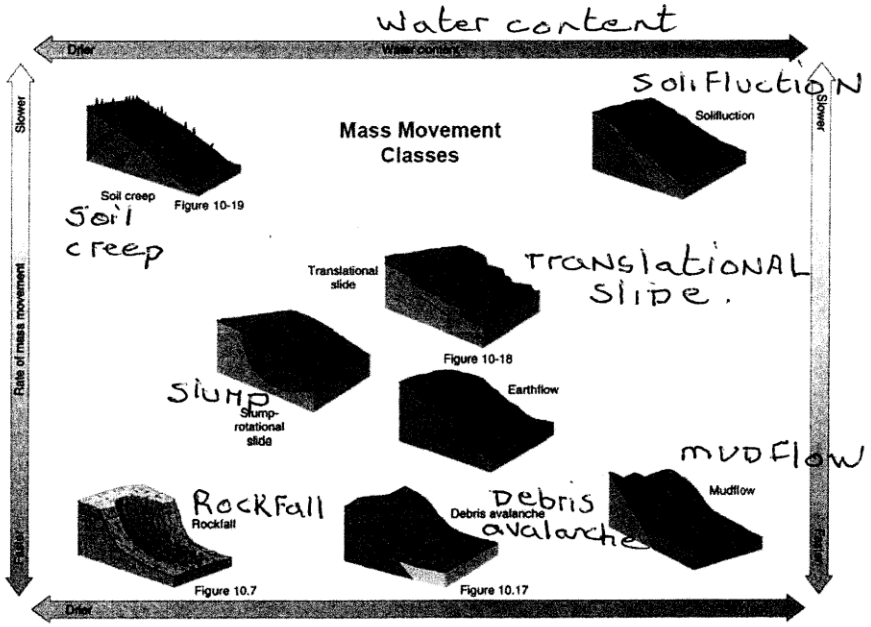
4.1 Describe the general shape/slope type of granite domes. (2)

4.2 Name the intrusive /underground feature that resulted in the granite dome forming. (2)

4.3 Describe briefly how the granite dome formed from the feature you named in 4.2. (Pay attention to the shape and structure of the eventual dome.) (3x2=6)

[10]

Question Five **Refer to the sketch below showing examples of mass movements.**



5.1 Choose the type of mass movement that matches each of the descriptions given below.

a. slowest type, common on the crest of slopes

b. when loose material on a slope follows a curved path

c. occurs when liquefaction of the soil occurs or when soil acts like a fluid

d. when water logged soil move gradually over the frozen ground underneath it. 4

5.2 **The photograph below shows recent damage to property as a result of mass movements in Umlazi south of Durban following two days of rain.**

5.2.1 What type of mass movement is likely to have occurred here? (2)

5.2.2 Explain the role that the rains played in causing this mass movement. (2x2-4)

5.2.3 Describe two other factors that may contribute to slope failures such as this one. (4)

5.2.4 Outline three measures that builders and land developers should take into account to Prevent mass movements like this from damaging property. (3x2=6)

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