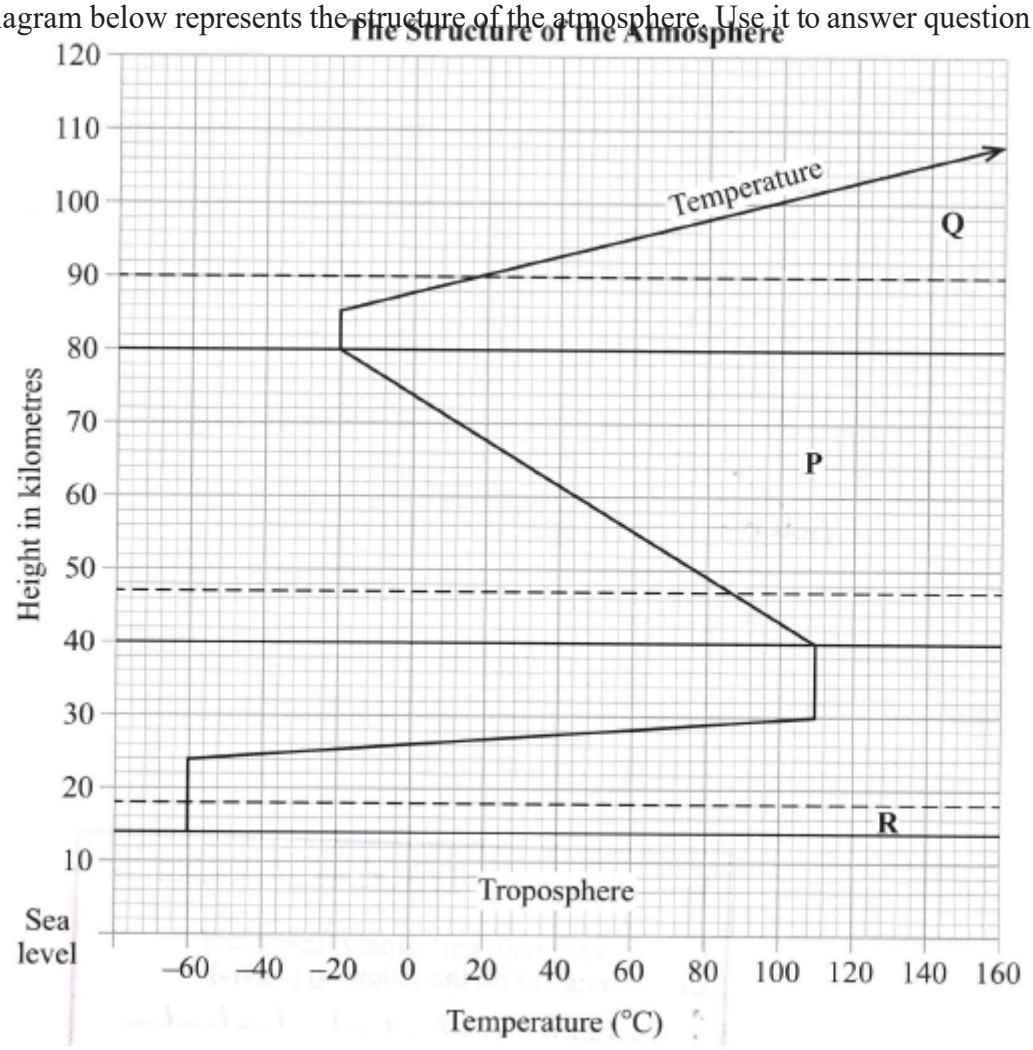
2013 Paper 1

4.9 GEOGRAPHY (312)

4.9.1 Geography Paper 1 (312/1)

SECTION A

1. The diagram below represents the structure of the atmosphere. Use it to answer question (a).



(a) Name

(i) the parts marked **P** and **Q**.

P - Mesosphere (1 mark)

Q - Thermosphere/Ionosphere (1 mark)

(ii) the layer of discontinuity marked **R**.

R - Tropopause (1 mark)

(b) State **two** characteristics of the weather conditions in the troposphere.

- Temperatures decrease with an increase in height/normal lapse rate / the rate decrease is 1°C for 160 metres of height/0.65^{0}C per 100 m/6.5 per 1000m
- Pressure falls with an increase in height.
- The speed of wind increases with an increase in height.
- It contains most of the atmospheric water vapour/clouds.

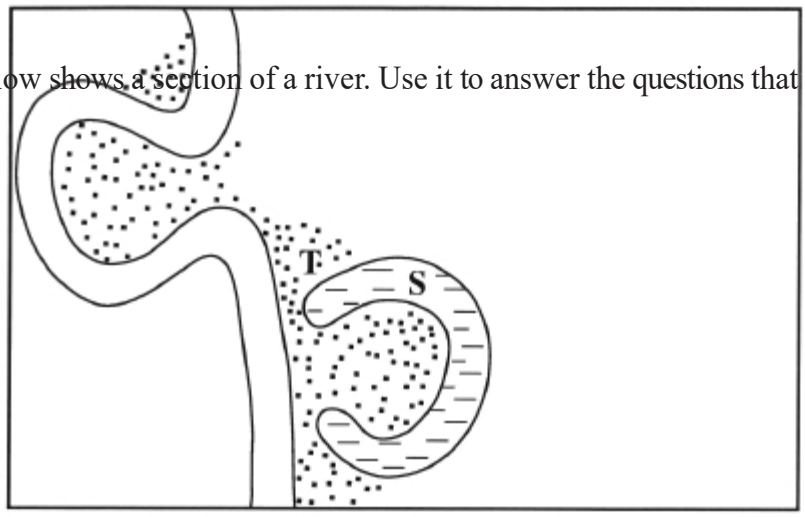
Any 2 x 1 = 2 marks

2. State **five** factors that influence mass wasting.

- Seismic/earth quake shocks lead to the movement of materials down slope.
- Increased overburden/deeply weathered thick/thinnly bedded rock materials are likely to move down slope.
- Increase in moisture lubricates the soil.
- Lack of vegetation reduces the ability of the soil to hold together.
- Under cutting of the slope by excavation/mining/quarrying/construction.
- Rearrangement of soil particles by living organism in the soil.
- The angle of slope determines the movement of the material.
- The nature of the underlying rock.

Any 5 x 1 = 5 marks

3. The diagram below shows a section of a river. Use it to answer the questions that follow.



(a) Name the features marked **S** and **T**.

S - ox-bow lake (1 mark)

T - alluvial deposits (1 mark

(b) State **three** conditions that are necessary for the formation of the feature marked **S**.

- Presence of pronounced meanders in the flood plain.
- Heavy load being carried by the river.
- A reduction in the river gradient/reduction in the river energy to erode vertically/ low velocity.
- Presence of obstacles in the river channel.
- Laterial erosion on the outer side of the river banks.

- Deposition on the inner side of the river banks.
- Periodic flooding to cut off neck of pronounced meander.

Any 3 x 1 = (3 marks)

4. (a) What is the difference between an ice sheets and an ice berg?

- Ice sheets is a continuous mass of ice covering vast areas of land while an ice bergs is a large block of ice (broken from ice sheets) floating in seas/oceans. (2 marks)

(b) Name **three** types of glacial moraines.

- Laterial moraine
- Medial moraine
- Terminal moraine
- Ground/subglacial moraine
- Recessional moraine
- Englacial moraine
- Push moraine.

Any 3 x 1 = (3 marks)

5. (a) Give **two** types of soil degeneration.

- Physical degeneration.
- Chemical degeneration.
- Biological degeneration.

Any 2 x 1 = (2 marks)

(b) State **three** economic benefits of soils.

- They provide the base for crop/forest cultivation.
- Some are sources of valuable minerals.
- They are raw materials for ceramic / pottery / sculpture industries.
- They are used for building houses / roads / bridges.
- Organic soils such as peat serve as fuel resource.
- Salt licks are livestock feeds.

Any 3 x 1 = (3 marks)

SECTION B

Answer **question 6** *and any other* ***TWO*** *questions from this section.*

6. Study the map of Karatina 1:50,000 (sheet 121/3) provided and answer the following questions.

(a) (i) What is the four figure grid reference of the Technical Institute at Mathira?

8559

(2 marks)

(ii) What is the bearing of Mount Kenya Campus at grid reference 932568 from the cattle dip at grid reference 990529?

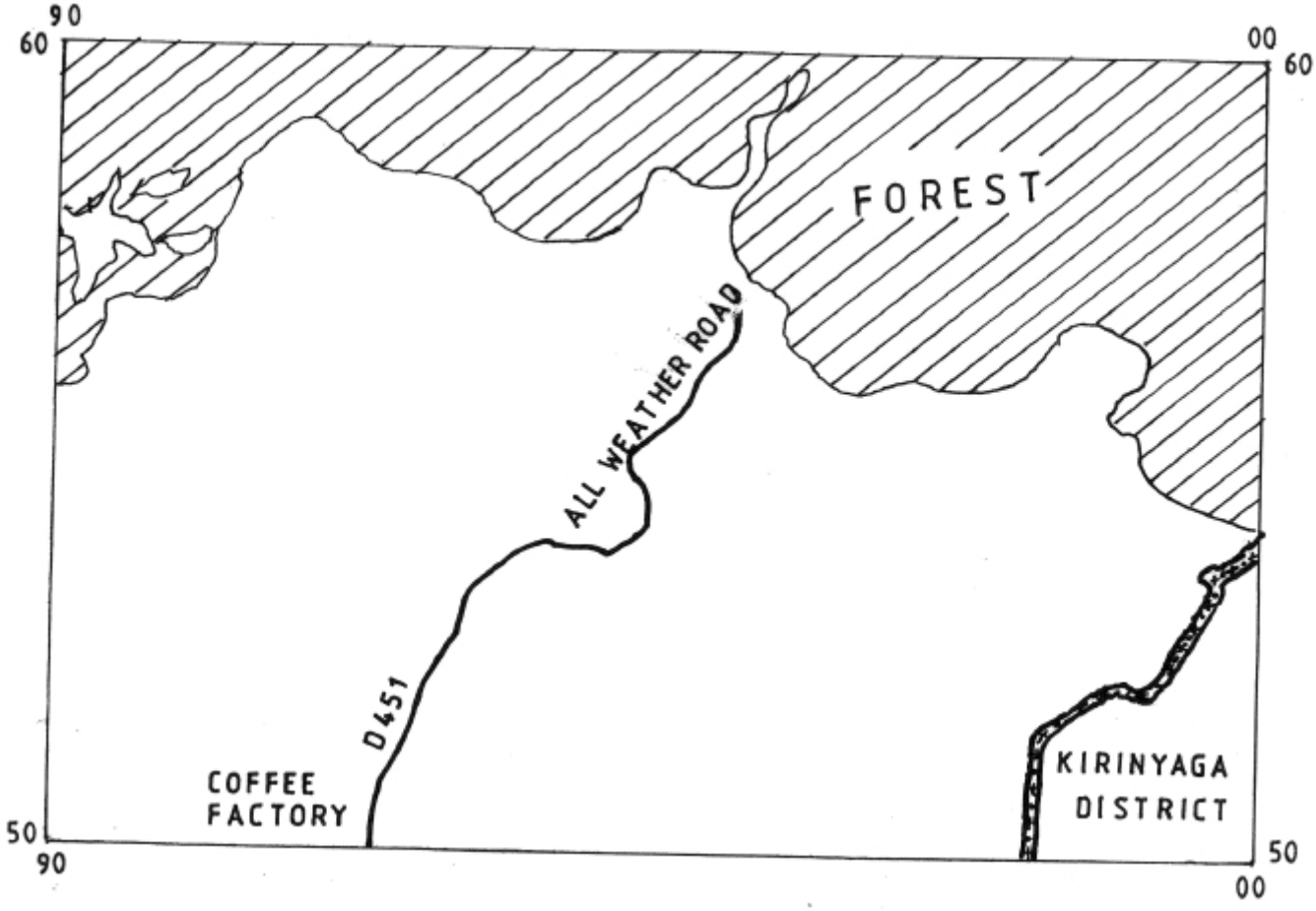
304° ± 1° (303⁰ - 305⁰) (2 marks)

(iii) Measure the distance of the railway line from the Level Crossing at grid square 8652 to the Southern edge of the map. Give your answer in kilometres.

13.3 km ± 0.1 - (13.2 - 13.4 km) (2 marks)

(b) Draw a rectangle measuring 15 cm by 10 cm to represent the area enclosed by Eastings 90 and 00 and Northing 50 and 60.
On the rectangle mark and name the following:

(i) Kirinyaga District;
(ii) All Weather Road Bound Surface;
(iii) Forest;
(iv) Coffee factory.



District	1
Rectangle	1
Forest	
Road	1
Coffee factory	1

(c) Describe the distribution of the natural vegetation in the area covered by the map.

- The high altitude / mountain area is covered by thick forest/bamboo.
- The forest mainly covers the Northern/North Eastern part of the area covered by the map.
- There is a few patch of forest in the Southern/South Western part of the area covered by the map.
- Woodland covers the North West, North/Eastern part of the area covered by the map.
- There is papyrus swamps vegetation found in the Southern/Southern Eastern part of the area covered by the map.
- There are riverine trees along river Nairobi/Kaduni/Sagana.
- Scrub vegetation covers the South Western part of the area covered by the map.
- Scattered trees cover the West/North Western part of the area covered by the map.

(NB/. Vegetation type must be located to score)

Any 3 x 2 = (6 marks)

(d) Identify **two** social functions of Karatina town.

- It is an educational centre.
- It is a residential centre.
- It is a religious centre.
- It is a health centre.
- Water supply.
- Electricity supply.
- It is a security/administration centre.

(2 marks)

(e) Citing evidence from the map, explain **three** factors that favour trading in the area covered by the map.

- The presence of numerous market centres / trading centres / shops which provide opportunities for trading (e.g Karatina, Tumu-Tumu, Kimahuri and Kagumo).
- The area has a well developed transport network for delivery of goods and services evidenced by all weather roads to Kerugoya, Sagana and Embu.
- The area is economically productive which provides goods as evidenced by tea/coffee factory, fisheries department/fisheries centre/research/cattle dip/murram pit.
- There are numerous settlements which suggests availability of markets for the variety of goods and services.

Any 3 x 2 = (6 marks)

7. (a) Name the first **two** planets of the solar system.

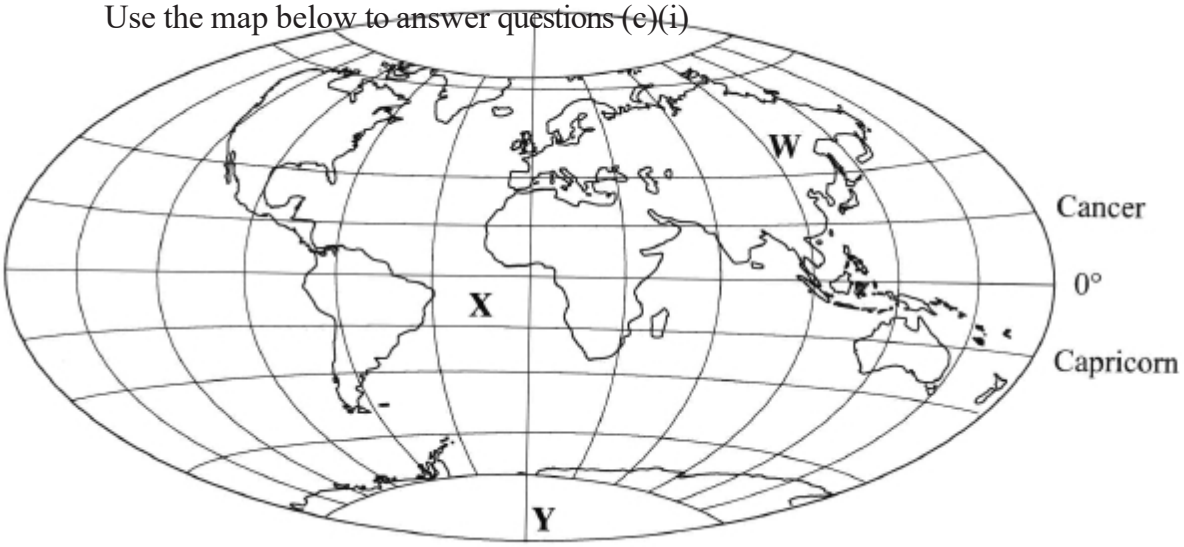
- Mercury (1 mark)
- Venus (1 mark)

(b) Explain the origin of the earth according to the Nebula Cloud Theory. (8 marks)

- The explosion of the stars led to the formation of a huge cloud of gases (hydrogen and helium), dust and ice particles.
- This cloud whirled, cooled and condensed to a disc shape.
- The gravitational attraction within the materials increased cause the particles to compact. Some particles broke from the edge of the disc and whirled.
- The compacted particles swirled faster towards the centre of the disc in different directions. As they whirled they cooled or solidified to form the planets.
- This swirling caused particles to collide losing a little energy at a time.
- The middle of the spinning disc condensed to form the sun while the material spinning around condensed into large chunks of materials called planetoids.
- The planetoids collided and coalesced into large bodies called planets.
- The earth is one of the planets.
- The centre of the disc formed the sun.

4 x 2 = 8 marks

Use the map below to answer questions (c)(i)



(c) (i) Name:

the continent marked **W** - Asia.

the ocean marked **X** - Atlantic.

the line of longitude marked **Y** - Prime/Greenwich meridian. (3 marks)

(ii) Give **two** reasons why the earth has a spherical shape.

- The earth experiences the force of gravity pulling towards the centre which creates a rounding effect on its shape.
- The North and South poles experience centripetal force which constantly pull

towards each other causing the flattening at the poles.

- At the equator the earth experiences the centrifugal force which causes the bulge.

Force 1 x 2 = 2
Shape 1 x 2 = 2
NB: F can score on its own. "S' must be tied to "F" to score.

(iii) State **four** effects of the rotation of the earth on its axis.

- It causes the occurrence of day and night /apparent movement of the sun from East to West.
- It causes difference in time between places over the earth's surface.
- It causes deflection of winds / ocean currents.
- It causes differences in atmospheric pressure on the surface of the earth.
- It causes ocean/sea tides

Any 4 x 1 = (4 marks)

(d) Describe the structure of the earth's crust.

- It's rocks are generally brittle/solid.
- The earth's crust extends between 6 to 80 km.
- It is divided into two layers - sial (continental crust) and sima (oceanic crust).
- The sial rests on the sima
- The sial contains mainly silica and aluminium.
- The sima contains silica, magnesium and iron.
- The sial is lighter/has a density of 2.65 to 2.70 gm per cc.
- The sial has mainly granitic rocks.
- The sima has basaltic rocks.
- The sima is heavier/has a density of 2.7 to 3.0 g/cc
- The sima is fairly flexible

Any 4 x 1 = (4 marks)

8. (a) What is volcanicity?

It is the process through which gaseous / liquid / molten rock / solid materials are forced into the earth's crust and / ejected onto the surface.

(2 marks)

(b) (i) Apart from a sill, name **three** other intrusive volcanic features.

- Dykes/dikes
- Laccolith/laccolites
- Batholith/bathyliths
- Lopolith
- Phacolith/phacolite

(ii) Describe how the following features are formed:

I a sill;

- Below the earth's crust the rocks are at very high temperature and high pressure. If the pressure becomes less, the hot, solid rock material may become semi-fluid / Magma under high pressure enters crustal rocks.
- The semi-fluid rock / magma forces itself into horizontal cracks/ fissures.
- The magma cools and solidities in horizontal cracks or bedding plane.
- This horizontal sheet/layer of igneous rock is called a sill.

(3 marks)

II hot springs;

- Rainwater enters the crustal rocks through cracks / fissures.
- The water reaches a zone of hot igneous rocks.
- The water is (super) heated.
- The super heated water changes into water vapour.
- The vapour is under high pressure and so forces its way up heating the ground water.
- The heated water under pressure flows out continuously/to form hot springs. (5 marks)

III A caldera.

- Lava pouring out of a central vent forms a volcanic cone.
- The vent may be sealed when lava solidifies in it.
- The solidified plug block the gases and steam beneath from escaping.
- There is pilling up of pressure below the plug.
- The pressure leads to a violent eruption that blows off the top of the cone forming a depression.
- The resulting large circular depression on the top of the (now lower) volvano is called caldera.

OR

A subsidence caldera

- Lava pouring out of a central vent forms a volcanic cone.
- The magma resevoir below the crust is left empty/has a void/cavity.
- With time the weight of rocks of the volcano exerts pressure on the crustal rocks below.
- The pressure/earth movements cause cracks to develop making the volcano unstable.
- Over time the middle portion of the volcano subsides/collapses into the void forming a depression.
- The resulting large circular depression on the top of the (now lower) volcano is called caldera.

OR

Outward collapsing

- Volcanic eruption of ash and cinder/pyroclasts throough a central vent forms a volcanic cone.
- Several eruptions results to a high, steep and unstable volcano.
- The weight of the upper materials exerts pressure on the ones beneath causing instability on the lower part.
- The material at the base begin spreading outwards.
- The top of the volcano collapses inwards forming a depression.
- The resulting large circular depression on the top of the volcano is called caldera.

(4 marks)

(c) Explain **four** negative effects of earthquakes.

- Violent motions resulting from earthquakes damage structures from their foundations leading to loss of life and property.
- When earthquakes occur faults may develop which damages infrastructure.
- During an earthquake on the sea floor vertical displacement occur leading to development of tsunami leading to floods of coastal areas/disrupts human activities loss of life/property.
- Earthquakes may lead to landslides which destroy agricultural land/loss of life/ damage of infrastructure..
- Strong vibrations from earthquakes may cause damage to nuclear plants which pollute the environment and affect human health.
- Earthquakes may cause panic/emotional shock/fear.

any 4 x 2 = (8 marks)

9. (a) What is vegetation?

It is the total mass of plant life that occupies a given area.

(2 marks)

(b) Explain how the following factors influence the distribution of vegetation:

(i) relief

- High altitude areas have low temperature which encourage scanty / no vegetation / low altitude areas have moderate temperature which encourage dense vegetation.
- Gently sloping areas are well drained hence encouraging dense vegetation growth / steep slopes experience excessive drainage that discourage plant growth.
- Flat areas tend to be water logged hence covered by swampy plant species.

Any 1 x 2 = (2 marks)

(ii) soils.

- Fertile soils have a variety of nutrients which encourage the growth of dense

vegetation/infertile soils have insufficient nutrients leading to scanty vegetation.
- Medium textured soils are well drained thus support a variety of plants /dense vegetation / coarse / fine textured soils are poorly drained leading to scanty / no vegetation.
- Deep soils enable the penetration of long roots thereby supporting trees / thin soils support vegetation of shallow roots thereby supporting grass vegetation.

Any 2 x 2 = (4 marks)

(c) Describe the characteristics of the savanna vegetation region.

- Vegetation is a mixture of trees and grass.
- The dominant type of vegetation is grass.
- In the wetter areas the vegetation consists of tall scattered trees, woodland.
- The wetter areas have a continuous cover of long thick grass.
- In the drier areas trees are shorter, fewer and scattered.
- In the drier areas the grass is short and coarse/tuft.
- Most trees are umbrella shaped crown.
- Most trees are acacia.
- Along the river valleys there are tall trees, thick bushes.
- Most of the trees are decidious/shed their leaves.
- Grass withers/turns brown during the dry season.
- Grass sprouts with onset of rains.
- Some trees have small/waxy/shiny/thin leaves/thony spines.
- Some trees have a thick bark/stem
- Some trees have long roots/tap roots.
- Most seeds are domant during dry seasons.

Any 6 x 1 = (6 marks)

(d) You are planning to carry out a field study in a forest.

(i) Give **four** reasons why it is important to seek permission from the school administration.

- It is an official requirement.
- To enable the administration arrange for transport/lunch/meals.
- To enable the administration take care of the disruption of the school programme that will occur
- To enable the administration to provide entry fee if required.
- To enable the administration to provide essential tools for use.

Any 4 x 1 = (4 marks)

(ii) List **three** sources of information you are likely to use before the actual field study.

- Relevant textbooks
- Journals / magazines
- Internet / electronic media
- Newspapers
- Professionals / botanists / forest officers
- Geography notes

- Photography/video tapes
- Maps

Any 3 x 1 = (3 marks)

(iii) Identify **four** challenges you are likely to encounter during the field study.

- Attacks by wild animals / insect / snake bites
- Adverse weather conditions/too wet/too cold.
- Thick/thorny vegetation/rugged terrain may hinder movement within the forest.
- Tiredness due to walking long distances.
- Inadequate time for data collection.
- Getting lost/loss of direction to follow.
- Uncooperative/absent respondent.
- Injuries

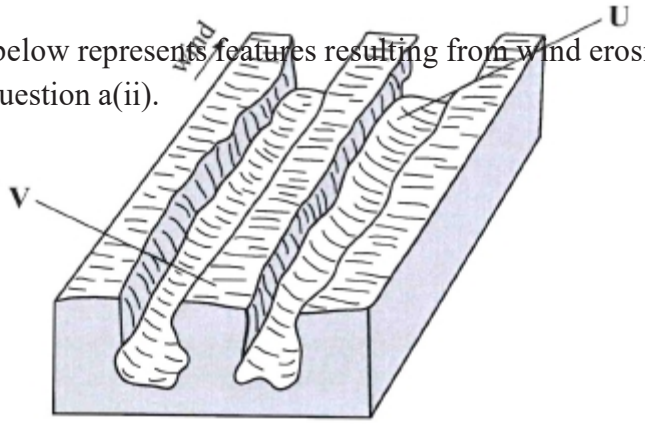
Any 4 x 1 = (4 marks)

10. (a) (i) Name **two** major deserts found in Africa.

- Sahara
- Kalahari
- Namib

Any 2 x 1 = (2 marks)

The diagram below represents features resulting from wind erosion in a desert. Use it to answer question a(ii).



(ii) Name the features marked **U** and **V**.

U - Furrow (1 mark)

V - Ridge/yardang/zeugen (1 mark)

(b) Describe the **three** processes through which wind transports its load.

Saltation

It is where coarse grained sand particles are transported through a series of bouncing / jumping along the surface. (2 marks)

Suspension

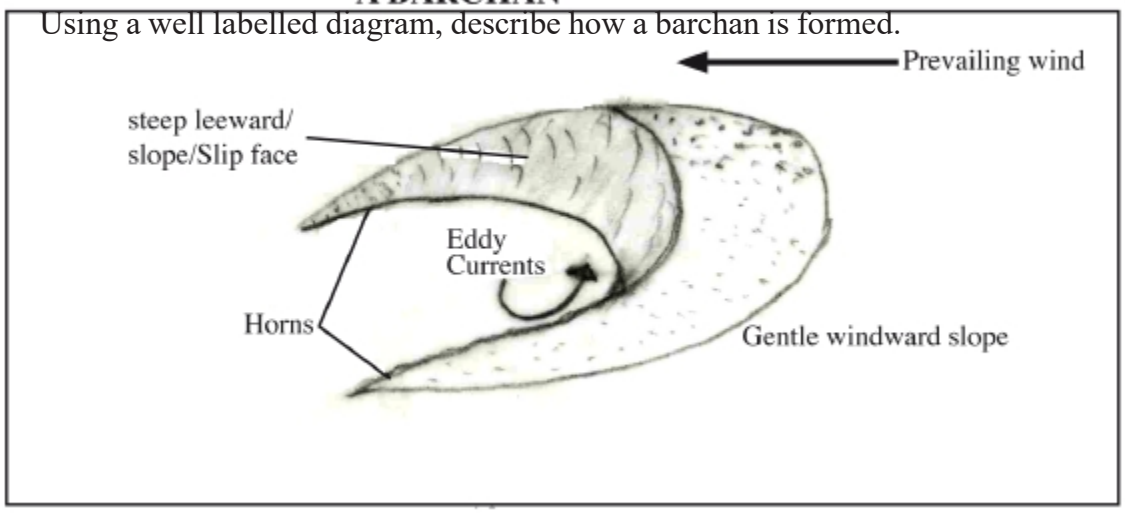
It is where very fine material is picked by wind raised high and blown over long distances. (2 marks)

Surface creep/rolling

It is where large / heavy material are rolled and pushed forward by wind along the surface. (2 marks)

(c) Using a well labelled diagram, describe how a barchan is formed.

A BARCHAN



- It develops in arid areas when sand accumulates around an obstacles that lies in the path of the wind.
- The gradual accumulation of sand forms a hill.
- Eddy currents on the leeward side of the dune causes the formation of a shallow depression / concave slope / steep slope.
- With time the prevailing wind forces the sand at the edge of the dune to move forward forming the horns.
- The continuous extension extension of the horns lead to a crescent shaped feature called barchan.

Explanation any 4 x 1 = (4 marks)
Diagram max. 3 marks

(d) Explain **four** ways in which desert features are of significance to human activities.

- Desert features form good sites for tourist attraction, thereby earning foreign exchange.
- Wind deflation hollows/oasis are sources of water for domestic /agricultural use.
- Wind deposited sands / loess form fertile plains for farming.
- Salty flats are economically used for salt production.
- Shifting sand dunes/hinder transport activities.
- Desert sceneries are ideal for film making.
- The vast sand seas are ideal for military training/nuclear testing.

Any 4 x 2 = (8 marks)