

FORM 4

GEOGRAPHY PAPER 1

MARKING SCHEME

1. a) Differentiate between latitude and longitude.

- A latitude is an imaginary line drawn from West to East and measured in degrees North or South of the Equator while a longitude is a line drawn on a map from North pole to South Pole and is measured in degrees East or West of Prime Meridian.
- Latitudes are parallel to each other while longitudes are further to each other at the equator but meet at the poles.
- Latitudes are longer at the equator but shorter at the poles while longitudes have equal length around the earth. (Any 1x2=2mks)

b) If the local time in New York 74° West is 08:00am, what is the time at Kitale 35° East?

$$74^{\circ} + 35^{\circ} = 109^{\circ}$$

$$109 \times 4 = 436 \text{ minutes}$$

$$= 7 \text{ hrs and } 16 \text{ minutes}$$

$$8:00 \text{ am} + 7 \text{ hrs, } 16 \text{ mins}$$

$$= 3:16 \text{ pm} / 15:16 \text{ hrs}$$

(1x3=3mks)

2. a) Other than fog, name two other forms of precipitation.

- Dew
- Frost
- Rainfall
- Sleet
- Snow
- Mist
- Hail

(Any 2x1=2mks)

b) State three conditions necessary for the formation of fog.

- The wind must be light / calm.
- The air must be cooled below dew point.
- There must be clear sky/ absence of clouds to allow free terrestrial radiation.
- There must be sufficient moisture in the air. (Any 3x1=3mks)

3. a) Name two types of earth movements that occur within the earth's crust.

- Vertical
- Horizontal

(1x2=2mks)

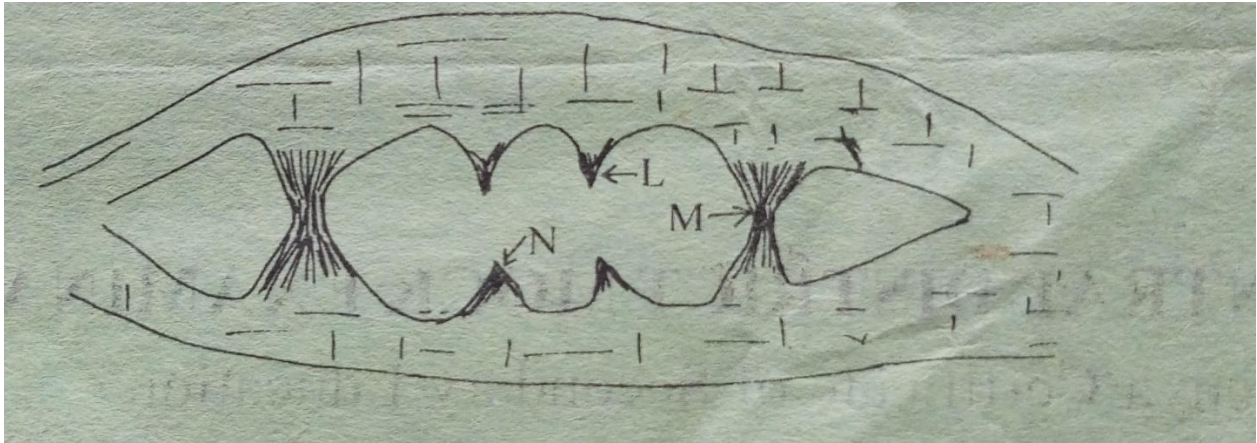
b) Mention any three causes of earth movements.

- Isostasy

- Magma movement
- Gravitational force
- Convectional currents

(Any 3x1=3mks)

4. The diagram below shows some underground features of a karst scenery. Use it to answer the questions that follow.



- a) Name the features marked

L – Stalactite

M – Limestone pillar

N – Stalagmite

(3x1=3mks)

- b) State two conditions necessary for the formation of a karst landscape.

- Presence of limestone/ dolomite /or chalk.
- Thick layers of calcium carbonate rocks.
- Hard and well jointed rocks.
- Low water table.
- Climate should be hot and humid to enhance chemicals weathering.
- Moderate to abundant rainfall.

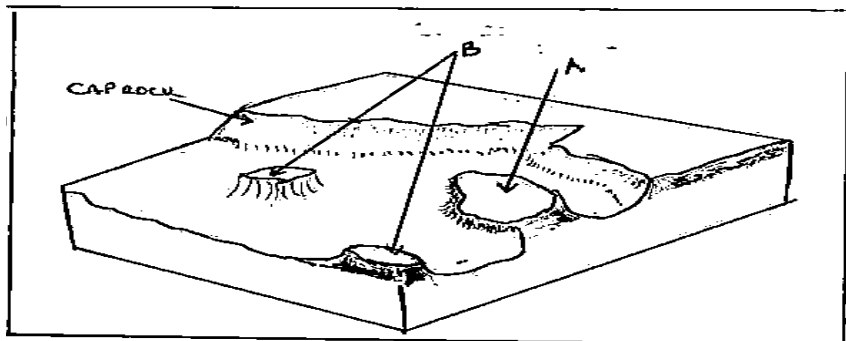
(Any 2x1=2mks)

5. a) State three processes of wind erosion in arid areas.

- Abrasion
- Attrition
- Deflation

(1x3=3mks)

- (b) The diagram below shows some features produced by water erosion in deserts.



i. Name the features marked A and B.

- A – Mesa
- B – Butte

(1x2=2mks)

SECTION B

6. Study the map of Mumias 1:50,000 (Sheet 101/2) provided and answer the following questions.

a) i) Identify the two methods used to represent relief on this map.

- Contours
- Trigonometrical stations
- Spot heights

(Any2x1=2mks)

ii) What is the Vertical Interval used on this map?

- 20m

b) i) Identify four man-made features found in grid square 6637.

- School
- Dispensary
- All weather road
- Trading center
- Footpath

(Any4x1=4mks)

(ii) What is the direction of Nyapera market from Buhuyu dam?

- South West

(1x2=2mks)

c) i) Giving evidences, identify three social services found in the area covered by the map.

- Education – schools/teachers training school
- Health services – dispensary
- Religion – convent/mission

(3x1=3mks)

ii) Explain two factors influencing settlement in the area covered by the map.

- Drainage - Areas covered by swamps have been avoided.
- There's little settlement along R. Nzoia since the area is prone to flooding.
- Vegetation – there's no settlement in areas occupied by riverine trees.
- Transport – there's linear settlement along roads and motorable tracks due to accessibility.

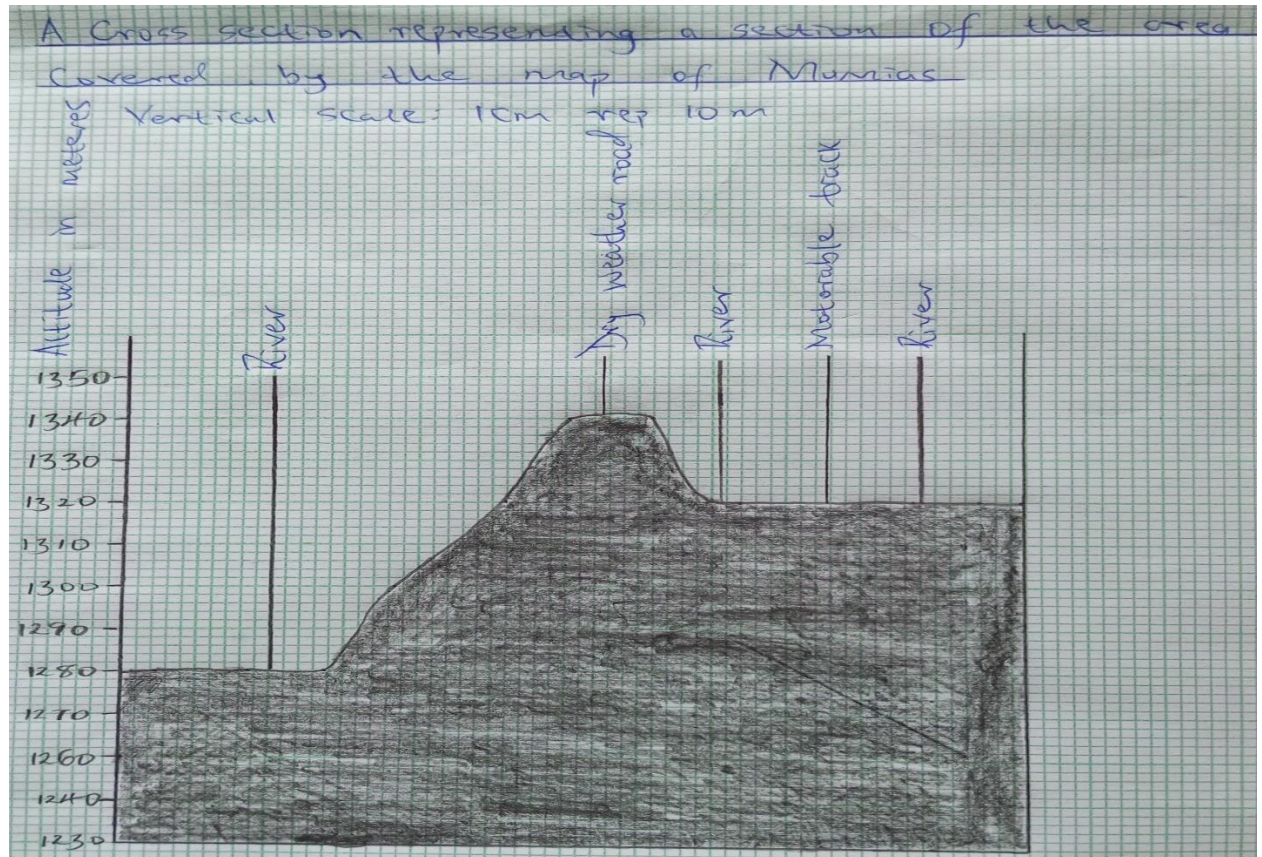
(Any2x2=4mks)

iii) Identify three types of natural vegetation in the area covered by the map.

- Scrub
- Riverine trees
- Scattered trees
- Woodland
- Papyrus

(Any 3x1=3mks)

d) Draw a cross section along Northing 29 from Easting 58 to 64. On the cross section, show the following:



7. a) (i) Distinguish between magma and lava.

- Magma is the molten rock which originates from the interior of the earth/ mantle cools while below the earth's crust and has large crystals **while** lava is the molten rock materials that has reached the surface and has small crystals.

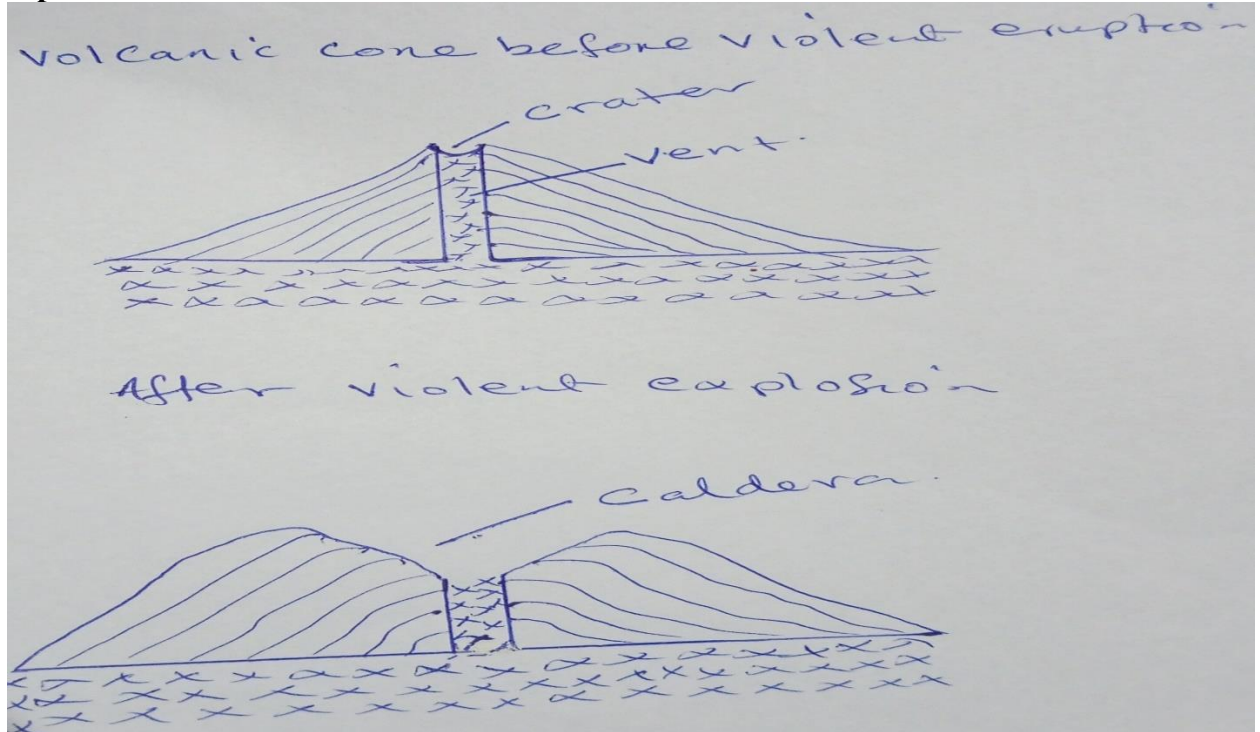
(1x2=2mks)

(ii) List any three intrusive volcanic features.

- Sill
- Dyke
- Batholith
- Laccolith
- Lopolith
- Phacolith

(Any 3x1=3mks)

b) Using a well labelled diagram describe the formation of a caldera by violent explosion.



- A volcanic cone forms and magma solidifies within the vent.
- Later volcanic activity beneath the surface builds pressure which leads to violent explosion that blows off the top of the cone.
- A wide open depression known as a caldera forms. (labeled diagrams- 4mks, text – 3mks)

c) Explain three negative effects of volcanicity in Kenya.

- Steep slopes formed through volcanic activity discourage settlement/ farming / development of transport.
 - Volcanic eruption may produce poisonous gases which pollutes the environment thus posing danger to life.
 - Volcanic mountain ranges create rain shadow effects which results into aridity.
 - Recent volcanic lava flows have poorly developed soils unsuitable for agriculture.
 - Some volcanic features create barriers making the construction of communication lines expensive and difficult.
- (Any 4x2=8mks)

d) Your class intends to carry out a field study on volcanic rocks.

i) State three ways you would prepare for the study.

- Identify the areas of study.
- Formulate objectives/ hypothesis.
- Identify methods of data presentation/ collection.
- Come up with a working schedule.
- Carry out a pre- visit/ reconnaissance study.
- Seek permission from relevant authorities.
- Obtain relevant tools for the study.

- Draw/ obtain a route map.
- Read relevant literature.
- Organize themselves into groups. (Any3x1=3mks)

ii) Give four reasons why it would be necessary to carry rock samples during the field study.

- Students do not have adequate skills to analyse samples hence the need for an expert's opinion.
- There's inadequate time in the field to carry out lab tests.
- To ensure students have a rich collection of rock samples for future use/reference.
- To create more interest and deepen understanding of the topic.
- It would expose more students to their findings once the samples/findings are presented to them. (Any4x1=4mks)

8. a) (i) State three factors that influence mass wasting.

- Angle of slope
- Nature of underlying materials
- Presence tectonic movements
- Climatic conditions
- Human activities
- Vegetation cover (Any3x1=3mks)

(ii) Describe how the following types of mass wasting take place.

- **Avalanche**
 - It is the rapid movement of rock and ice down a mountain/valley slope by gravity.
 - It can occur if a fresh fall of snow is not firmly consolidated.
 - This is forced to slide off the former /older snow.
 - It may also be triggered when partially thawed masses of enormous ice fall down the valley slopes. (3x1=3mks)
- **Slumping**
 - Heavy rainfall causes saturation of underlying materials.
 - The saturated underlying materials/rocks/debris cause the surface rocks to slide downslope.
 - The overlying rocks/debris slide downhill while rotating on a curved plane. (3x1=3mks)

iii) List three types of rapid mass wasting.

- Earthflow
- Mudflow
- Avalanche
- Landslide
- Debris fall
- Debris slide
- Rock fall
- Rock slide (Any3x1=3mks)

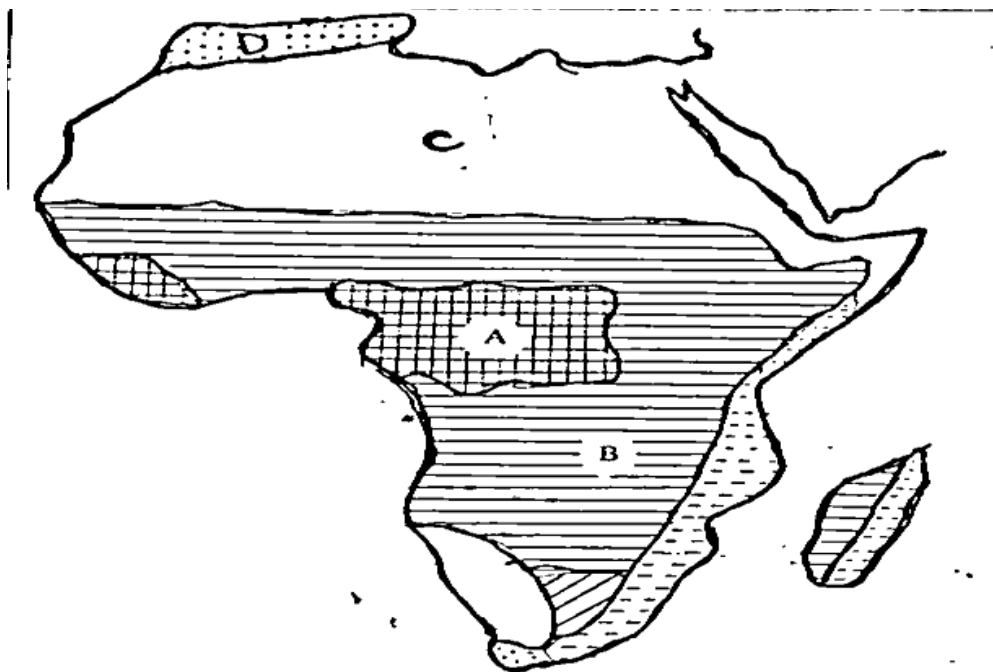
b) Students from your class carried out a field study on mass movement around your school.

(i) State three evidences of soil creep you are likely to identify during the study.

- Mounds of soil behind walls
 - Tilting walls/fences
 - Bending tree trunks
 - Tilting poles/posts
 - Cracked roads/partially blocked roads (Any3x1=3mks)
- (ii) **Name any three methods of data collection you're likely to employ during the study.**
- Interviewing.
 - Direct observation.
 - Administering questionnaires.
 - Counting.
 - Measuring
 - Photographing
 - Content analysis
 - Observing
 - Experimenting (Any3x1=3mks)

c) Explain four effects of mass wasting on the environment.

- Landslides make the land barren and exposed to agents of erosion.
 - Mass wasting produces soil that is used as a raw material in the pottery industry creating employment opportunities.
 - Landslides can force a river to change its course /direction when it gets blocked by debris.
 - Features created through mass wasting are a tourist attraction, hence a source of foreign exchange to the government, revenue to county governments.
 - Landslides cause loss of life and destruction of property.
 - Landslides at times form barriers across a river valley leading to formation of lakes on the upper side of a river valley.
 - Mass wasting leads to permanent scars on the landscape making it physically unsuitable for human settlement.
 - Mass movement leads to loss of life when residential homes are buried. (Any4x2=8mks)
- 9. Below is a map of Africa showing climatic regions. Use it to answer the questions that follow.**



a) Identify the climatic regions marked A, B and C

- A – Equatorial climate
- B – tropical desert climate
- C – Mediterranean climate (3x1=3mks)

b) Outline four characteristics for each of the following climatic regions.

(i) Climatic region marked A

- High rainfall throughout the year/2000mm.
- Experiences double rainfall maxima rainfall regime.
- Rainfall is mainly convectional and falls in the afternoon, accompanied by thunderstorm.
- High temperature throughout the year/27°C.
- Annual range of temperature is small /3°C to 5°C.
- Low diurnal range of temperature/6°C to 8°C.
- There is extreme cloud cover.
- Experiences long hours of sunshine.
- Area low atmospheric pressure. (Any4x1=4mks)

(ii) Climate region marked C

- Hot summers with temps approximately 21°C and mild winters.
- Moderate annual range of temperature, approximately 10°C.
- Mean annual rainfall of between 500 – 900 mm.
- Offshore trade winds in summer causing a drying effect.
- Hot and cold local winds are common. (4x1=4mks)

c) Describe four human activities that may contribute to climate change.

- Human activities which lead to emission of chlorofluorocarbons (CFC's) and other gases as well as emissions from industries and motor vehicles lead to changes in the composition of the atmosphere, this leads to global warming.

- Overstocking which compacts the soil leading to aridity that causes abnormal/unchecked high temperatures.
- Clearing vegetation for settlement leaves the soil bare and hard resulting in flooding during the rainy seasons.
- Wartime and mining explosions release greenhouse gases that cause increase in temperatures over oceans causing deadly storms.
- Dairy farming results in the release of excess methane gas in the atmosphere which causes increase in atmospheric temperatures. (Any4x2=8mks)

d) (i) Describe a suitable site for locating a weather station.

- The space must be open to allow free circulation of air.
- A site free of obstructions like building, trees e.t.c to avoid obstruction of wind, rain and suns rays.
- Site should have minimum interference from people and animals ie fenced and secured.
- The area should have gently sloping land of at least a gradient of 50.
- The space or area should provide a wide view of the surrounding landscape and sky.
- The area should be free from flooding or heavy surface run off. (Any2x1=2mks)

(ii) Give reasons why a Stevenson screen:

- **Has louvres**
- To allow free circulation of air/ keep the screen well ventilated. (1x2=2mks)
- **Is painted white**
- To help in reflecting heat from the sun thus maintaining room temperature in the screen. (1x2=2mks)

10. (a) (i) Differentiate between river rejuvenation and river capture.

- River rejuvenation is the renewal /rebirth of a rivers erosive power, while river capture is the diversion of the head waters of a weaker river into the system of an adjacent more powerful river (1x2=2mks)

ii. Name three features that form as a result of river erosion.

- V-shaped valleys
- Waterfalls
- Rapids
- Gorges
- Potholes
- Interlocking spurs (Any3x1=3mks)

(b) i) Explain four ways through which a river transports its load.

- Some particles e.g. silt are carried in suspension because they are light and can be maintained within the turbulence of the water.
- Some of the load is dissolved in water and carried in solution.
- The large and heavy particles are rolled along the river bed, in a process known as traction.
- Some particles are fairly heavy and momentarily lifted by the turbulence of the water and then dropped on to the river bed, a process known as saltation. (4x2=8mks)

ii) Give two ways by which rivers can improve food security in a region.

- Some rivers are rich as fishing grounds e.g Fraser River in Canada.

- During flooding, fertile alluvial deposits may provide fertile soils for agriculture.
- Rivers provide water for irrigation which increases food production. (1x2=2mks)

(c) You are planning to carry out a field study on the lower course of river Tana.

(i) Give three reasons why you would require a route map.

- To enable one to locate features/ areas of study.
- To show direction to be followed during the field study.
- To assist in estimating the time required for the study.
- To help in estimation of location/ distance to be covered during the study.
- To help in drawing a work schedule.
- To be able to know the direction of area of study. (Any 3x1=3mks)

(ii) State four characteristics of a river at the old stage that you're likely to observe.

- The river's gradient is low.
- The river flows very slowly due to reduced velocity.
- There is great deposition of alluvium.
- Lateral erosion takes place.
- Seasonal floods are common.
- River has a large volume of water.
- Rivers have deferred tributaries.
- There are ox-bow lakes.
- Rivers carry large amounts of alluvium/silt. (4x1=4mks)

(iii) Give three follow-up activities you would undertake in relation to the field study.

- Report writing.
- Class discussion.
- Group presentations.
- Ask/ answer questions.
- Read more on the topics.
- Display collected specimens.
- Analyze photographs/ tape/ video records. (3x1=3mks)