312/1
GEOGRAPHY
Paper 1
March, 2023
Time 2 hours 45 min.

MOKASA II JOINT EXAMINATION

Kenya Certificate of Secondary Education

312/1

Paper 1

GEOGRAPHY

MARKING SCHEME

-SECTION A: 25 MARKS

*Answer **ALL** questions in this section*

1. (a) Explain the relationship between Geography and Chemistry. (2 Marks)

- *Geography applies chemistry in studying chemical composition/properties of rocks and soils that results to the formation of geographic features.*
- *Chemistry knowledge helps in understanding chemical processes in physical geography such as carbonation/ hydrolysis/ solution/ hydration/ oxidation.*
- *Chemistry knowledge helps in understanding chemical changes in rocks ~~and~~ soils.*

(b) State the importance of studying Geography. (3 Marks)

- *It helps to develop mental skills.*
- *It enables learners understand/appreciate different environmental awareness/cooperation.*
- *It encourages international awareness/cooperation.*
- *It helps learners appreciate important social values such as time management/responsibility.*
- *It promotes positive attitude towards protection/conservation of resources (natural)*
- *It leads to development of career opportunities.*
- *It enables learners to explain the origin/formation of the earth/landforms*

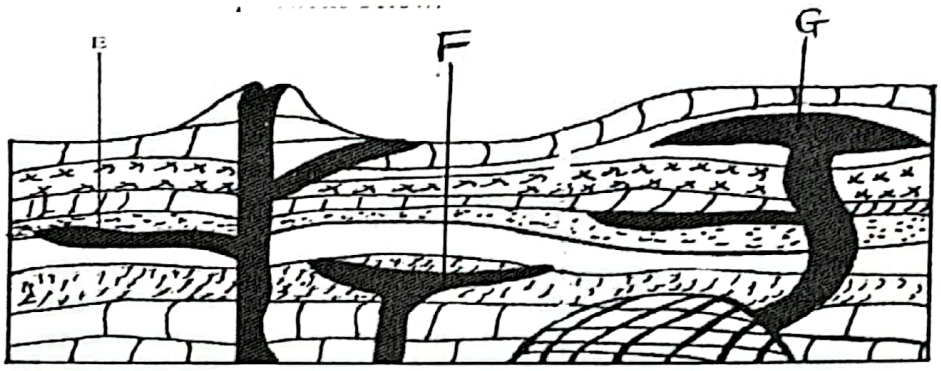
2. (a) Give ***three*** evidences showing that the interior of the earth is hot. (3 Marks)

- *Ejection of hot water [illegible] geysers.*
- *Volcanic eruption/ vulcaicity.*
- *Molten state of [illegible] most of the interior rocks.*
- *High temperatures experienced in deep mining.*

(b) Define the term solstice. (2 Marks)

- *A solstice is a period of the year when the mid-day sun is overhead at the tropics.*

3. The diagram below show intrusive volcanic features.



(a) Name the landforms marked **E** and **F.** (2 Marks)

E - *Sill*
F - *Lopolith*

(b) Describe how the laccolith is formed. (3 Marks)

- *Earth movement causes vents/cracks in the crustal rocks.*
- *Acidic Magma intrudes crustal rocks through the vents.*
- *Magma accumulate around the vent, cools and solidifies.*
- *This forms a are very large dome-shaped intrusion of magma which pushes the country rock upwards known as a laccolith.*

4. (a) State ***two*** factors influencing the rate of wave deposition. (2 Marks)

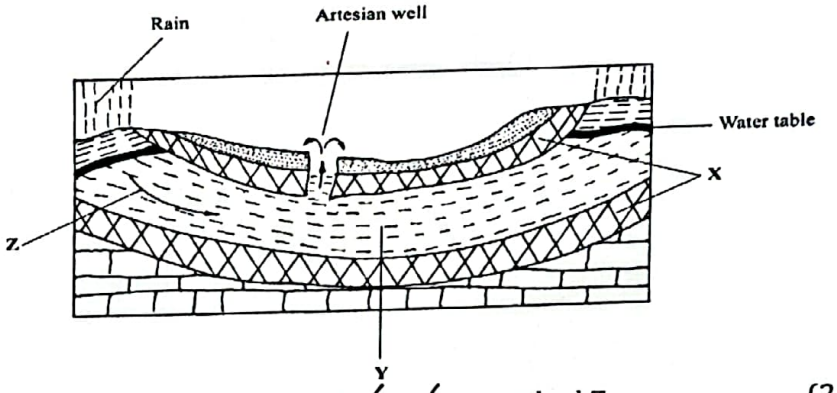
- ✓ *Depth of water.*
- ✓ *Configuration of the coastline*
- ✓ *Gradient of the shore.*
- ✓ *The strength of the wave.*

(b) Describe how a spit is formed. (3 Marks)

- ✓ *A spit forms on a shallow shore at a point where there is a sudden change in the angle of the coastline.*
- ✓ *The longshore drift deposits materials that is sand, shingles and pebbles at such point.*

- ✓ *The deposition continues extending into a bay with one end attached to the land.*
- ✓ *Eventually a ridge with one end attached to the land and the other projecting into the sea is formed called a spit.*

5. The diagram below show an artesian basin.



(a) Name the part marked **X** and the process marked **Z.** (2 Marks)

X - *Impermeable rock*
Z - *Percolation*

(b) State ***three*** conditions necessary for the formation of artesian basin. (3 Marks)

- ✓ *The aquifer must be sandwiched between two impermeable rock layers.*
- ✓ *The aquifer must be exposed in an area of sufficient precipitation.*
- ✓ *The mouth of the well must be lower than intake area.*
- ✓ *The rock structure must form a shallow syncline.*
- ✓ *The margins of the aquifer must be exposed.*

SECTION B

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

6. (a) Study the map of **Kisumu East 1:50 000 (sheet 116/2)** provided and answer the Following questions.

(i) Name ***three*** physical features found in grid square 0788. (3 marks)

- *River*
- *River valley*
- *Seasonal swamp*
- *Plain*

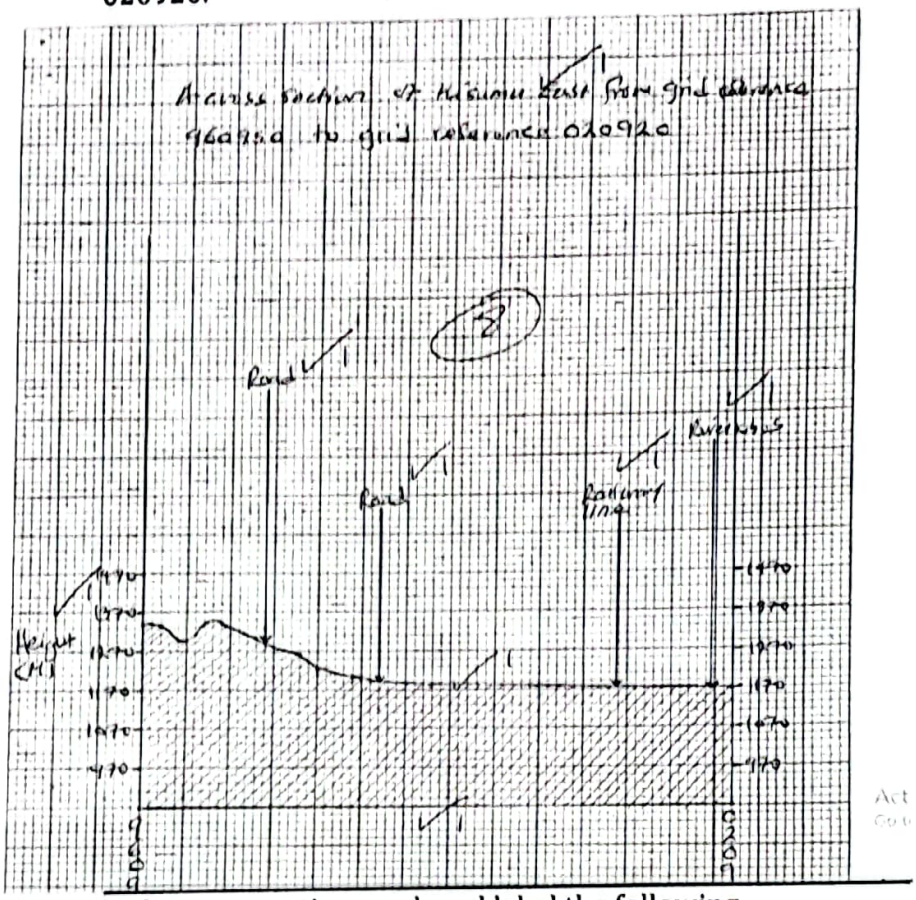
(ii) Measure the length of all-weather road bound surface B25/3 East of Easting's 02. Give your answer in Km. (2 marks)

- *8.6 Km 0.1 Km (8.5, 8.6, 8.7)*

(iii) In which hemisphere is Kisumu East? (1 mark)

- *Southern Hemisphere* ✓

(b) (i) Using a vertical scale of 1cm to represent 100 metres, draw a cross section of Kisumu East from grid reference 960950 to grid reference 020920. (4 marks)



(ii) On the cross section mark and label the following.

- Hill
- River
- Railway line
- All weather roads bound surface C543/1

(iii) Determine the intervisibilty of the end point of your cross section. (2 marks)

- *The two end points are not intervisible.* ✓

(c) (i) Describe the drainage of the area covered by the map. (4 marks)

- *The main river is river Nyanza Sawa* | Ombey | Luando
- *The area is drained by many permanent rivers by by river Luando.*
- *The area is drained by seasonal swamp in Kano plain*
- *The area is drained by papyrus swamp of Nyalenda.*
- *River Luando and its tributaries form dentric pattern.* ✓ dentritic

- *River Luando forms a delta*
- *Most rivers flow south westwards.*

(ii) Citing evidence from the map, state **five** functions of Kisumu town. (5 marks)

- *Education centre evidence by school.*
- *Administrative centre evidence by District office / police line*
- *Recreational centre evidence by stadium*
- *Religious centre evidence by church / mission / mosque*
- *Medical centre evidence by Hospital*
- *Transport centre evidence by roads / Railway line.*
- *Industrial centre evidence by sisal factory*

7. (a) (i) Distinguish between minerals and rocks. (2 marks)

A mineral is an inorganic homogenous substance which occurs naturally on or beneath the surface of the earth while a rock is a naturally occurring solid material composed of one or more minerals and form the solid part of the earth's crust.

(ii) Describe the following characteristics of minerals.

- Colour (2 marks)

  Different minerals display different colours e.g. minerals that have iron are dark in colour.

- Hardness (2 marks)

  Some minerals such as diamond have a high resistance to disintegration while others such as talc are soft.

(b) (i) What are sedimentary rocks? (2 marks)

- *These are rocks which are composed of sediments which are laid down in layers in water / land.*

(ii) Give ***three*** sources of the particles which form sediments that form sedimentary rocks. (3 marks)

- *Existing rocks through weathering/erosion.*
- *Mineral compounds which were dissolved in water.*
- *Remains of millions of organisms which settle on the seabed.*
- *Plant remains which were buried on land / water.*

(iii) Describe ***two*** ways through which sedimentary rocks are formed. (4 marks)

- ***Mechanically formed.***
  - *These rocks are formed when eroded rock materials are transported by agents of erosion and deposited in layers on land or in sea.*
- ***Organically formed***
  - *These rocks are formed when remains of previously existing plant or animal organisms are accumulated over a long period of time forming layers.*
- ***Chemically formed.***
  - *These are formed when rocks are precipitated or when solutions of salt evaporate and particles accumulate in layers.*

(c) (i) Describe thermal dynamic process of rock metamorphism?(3 marks)

- *During the mountain building process, sedimentary rocks are compressed and due to the pressure heat is generated. The heat modifies the structure of the original rocks.*

(ii) State ***two*** changes that occur in sedimentary rocks, when they are subjected to intense heat and pressure. (2 marks)

- *New minerals are formed.*
- *The minerals recrystallize*
- *The rocks become compacted/hard*
- *The physical appearance of the rock changes*

(d) Give ***five*** uses of rocks. (5 marks)

- *Rocks weather down to form soil which support agriculture.*
- *Some rocks act as reservoirs for water/oil/gas*
- *Rocks provides materials for building and construction industry.*
- *Some Rocks are sources of minerals.*
- *Some rocks act as tourist attraction.*
- *Some rocks are used in sculpturing/curving industry to make ornaments*
- *Study of rocks provides information about the past.*
- *Some rocks are sources of food e.g. rock salt*
- *Some rocks provide raw materials for manufacturing industries.*

8. (a) (i) Identify ***three*** types of folds (3marks)

- *Simple symmetrical folds*
- *Asymmetrical folds*
- *Over folds*
- *Isoclinal folds*
- *Recumbent folds*
- *Nappe /Over thrust fold*
- *Anticlinorium and Synclinorium Complex fold.*

(ii) Apart from Fold Mountains, identify ***three*** features resulting from folding (3marks)

- *Escarpments*
- *Depressions*
- *Ridge and Valley landscape*
- *Rolling Plains*
- *Inter-montane Plateaus*
- *Inter-montane basins*
- *Synclinal valleys / Valleys*

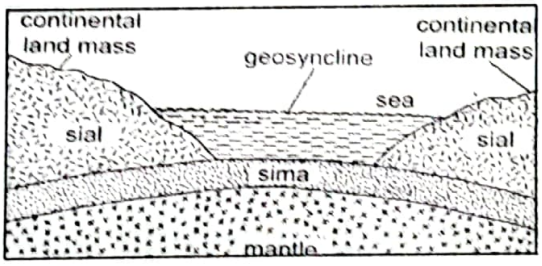
(b) Identify the countries where the following fold mountains are found (3 marks)

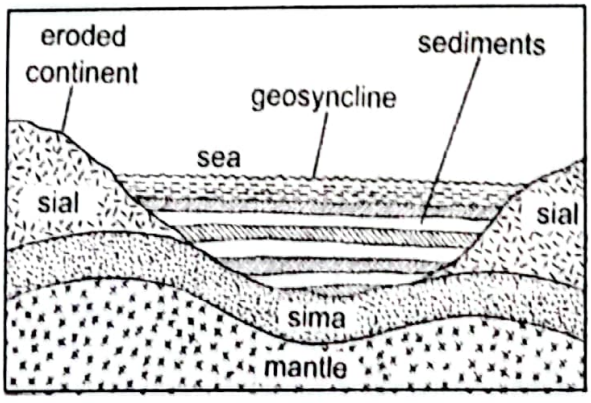
- Andes
  - *Chile/Peru/Bolivia/Argentina/Ecuador/Colombia*
- Rockies
  - *Canada/Mexico*
- Alps
  - *Austria/Switzerland/Italy/France*

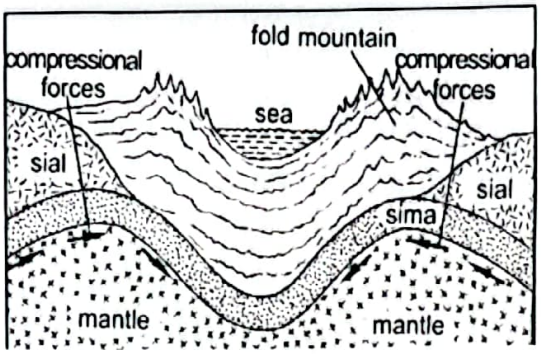
(c) (i) Differentiate between an orogeny and orogenesis (2 marks)

- *Orogenesis is the process of fold mountains formation while Orogeny is the fold mountain-building period.*

(ii) Using well labelled diagrams, describe how Fold Mountains were formed (8 marks)







- *The crustal rocks are subjected to compressional forces.*
- *The rocks bend upwards and downwards to form an extensive shallow depressions called geosynclines on the earth's surface.*
- *The geosyncline is filled with water.*
- *Prolonged and extensive erosion occurs on the surrounding higher grounds.*
- *Sediments are deposited in the geosyncline in thick layers.*
- *The great weight of the sediments cause the subsidence of the geosyncline leading to accumulation of more sediments to great thickness.*
- *Further subsidence of the geosyncline triggers off compressional forces which causes the sediments to fold.*

Text-5
Diag-3

(d) Explain the effects of fold mountains on climate (6 marks)

- *The slopes of fold mountains facing the sun receive direct sunshine hence are warmer than those facing away from the sun.*
- *Fold Mountains cause the development of anabatic and katabatic winds which have a cooling effect on the slopes.*
- *The windward slopes of Fold Mountains generally receive heavy rainfall while the leeward slopes receive low rainfall due to orographic effect.*
- *Fold Mountains due to their high altitudes have an effect on reduction of pressure with increasing altitude.*

9. (a) (i) Define river catchment. (2 marks)

- *Is the area that drains all the rain water that falls in it into the river?*

(ii) Give ***three*** importance of measuring river discharge. (3 marks)

- *Use to predict floods*
- *Use to predict periods of low and normal flow*
- *Used to determine suitability for Irrigation*
- *Use in establishing H.E.P Production*

(b) (i) Identify ***two*** types of river erosion. (2 marks)

- *Head ward erosion*
- *Vertical erosion*
- *Lateral erosion*

(ii) Explain ***two*** ways in which a waterfall may form. (4 marks)

- *When a layer of more resistant rock lies across a rivers courses the less resistant rock downstream is eroded faster steeping river bed leading to formation of a water fall*
- *Where a river descends a sharp edge of a plateau.*
- *Where a river descends a fault scarp cliff*
- *Where a river descends a lifted coast into an ocean*

(iii) Using well labelled diagrams, describe the formation of an Ox-bow lake. (8 marks)

- *When a river begin to meander in the flood plain, intense lateral erosion and undercutting of its outer bank takes place forming a bluff.*
- *On the inner bank the currents are weak causing more deposition to take place. Continued erosion leads to narrowing of the land that separate the two concave banks.*
- *Continued erosion of the outer bank the meanders grows out wards and deposition on inner bank.*
- *Evenly the two concave banks join causing the river to take a short cut.*
- *When the meander is cut off it forms a meander loope known as an ox-bow lake*

OR

- *It forms when a river starts to meander an a flood plain*
- *Lateral erosion dominates the outer bank of the meander (convex)*
- *Deposition takes place an the inner bank of the meander (convex)*
- *Lateral erosion leads to redirection of the narrow piece of land or neck separation bends and eventually its worn out*
- *Deposition on the meander side during floods blocks off the meander.*
- *The river abadons the meander and takes a short cut*
- The cut off meander forms an ox-bow Lake

Text-5 Marks
Dig-3 Marks
8 Marks

- *The cut off meander with its forms an ox – bow lake.*

(c) **Explain three significance of rivers and resultant features to human activities.** **(6 marks)**

- *Waterfalls along rivers channel provide sites for hydro – electric power generation used in homes industries.*
- *Rivers provide fresh water for irrigation*
- *Rivers supply water for domestic and industrial use.*
- *Some rivers are fishing grounds providing fish.*
- *River valleys are source of building material such as sand and stones.*
- *Some rivers channels contain vulnerable minerals such as alluvial gold and diamond which mined to earn income.*

10. (a) (i) **Define the term soil.** **(2 marks)**

- *Soil is a naturally occurring thin layer of loos/unconsolidated material which overlies the crustal rock and on which plants grow./It is the superficial layer of loose unconsolidated rock material overlaying the crustal rock and on which plants grow.*

(ii) **Name three components of soil.** **(3 marks)**

- *Soil air/gases*
- *Soil water/moisture*
- *Soil organic matter*
- *Soil inorganic matter/minerals*

(b) (i) **Describe laterization as a process of leaching** **(4 marks)**

- *During the wet season, mineral salts in the top layer of the soil dissolve in rain water.*
- *The dissolved minerals percolate/seep downwards from the top soil to the sub-soil (silica and bases)*
- *The dissolved minerals move/are deposited further downwards to the lower layer.*
- *Insoluble minerals such as iron and aluminium accumulate on the top layer to form a crust of laterites hence laterization.*

(ii) **Describe how the following types of erosion occur.**

- **Rill erosion.** **(3 marks)**
  - *Occurs on gentle/moderate slopes which have bear/ with scanty vegetation.*
  - *Heavy rain falls and the water in form of runoff drains off the slope through small channels called rills.*
  - *Soil particles within the channel are detached through hydraulic action and abrasion and washed downstream through a process call rill erosion.*

- Sheet erosion (2 marks)
  - *Occurs on gentle slopes which are bare.*
  - *When rain falls, water spreads over a large area*
  - *As water moves, it removes the top layer evenly over the area.* This sheet erosion

(c) (i) Apart from leaching, give ***three*** other processes that contribute to soil formation. (3 marks)

- *Through weathering*
- *Through decomposition of organic matter.*
- *Through burrowing of animals*

(ii) Explain ***four*** measures being taken to conserve soil in Kenya. (8 marks)

- *By mulching the soil to provide nutrients after the plant materials decay.*
- *By practicing mixed farming so that the animals can feed on plants while providing manure to maintain fertility.*
- *By practicing crop rotation to reduce over use of some minerals, thus maintaining fertility.*
- *By proper application of fertilizers/manure that provide plants with food.*
- *By controlling soil erosion which carries the top soil, thus reducing fertility.*
- *By practicing land fallowing to allow the land to rest thus regaining fertility naturally.*

– Afforestation / reafforestation / agroforestry