TEACHER.CO.KE
FORM FOUR GEOGRAPHY PAPER 1 (312/1)
TERM 1 OPENER 2022 **DURATION: 2 HOURS 45 MINUTES**

MARKING SCHEME

SECTION A

1. (a) What are igneous rocks ? (2 marks)

These are rocks formed due to cooling and solidification of hot molten magma or lava.

(b) Give **two** examples of organically formed sedimentary rocks. (2 marks)

Limestone, chalk, coral reefs, Diatomite Ironstones, Coal and peat

2. (a) Name **two** types of faults associated with compressional forces. (2 marks)

- ***Reversed faults***
- ***Thrust faults***
- ***Anticlinal faults***

(b) State **three** characteristics of the Gregory Rift valley of Kenya. (3 marks)

- ***The height of escarpment varies at various points***
- ***The altitude at the floor of the rift valley differs at various points***
- ***The width of the rift valley varies at different points.***
- ***A number of volcanoes occur on the floor of the rift valley.***
- ***Uneven sinking created depressions that are occupied with water forming lakes.***
- ***Several fault blocks border the rift valley.***
- ***Step faulting is evident near Kimende and at Tambach.***

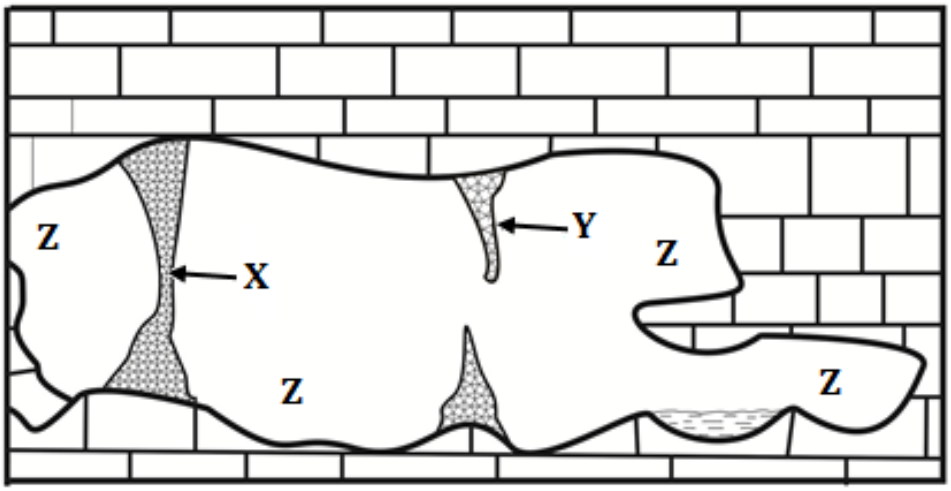
3. (a) Name **two** types of grasslands found in Africa. (2 marks)

- ***Savannah***
- ***Veldt***

(b) State **three** reasons why some mountain tops have no vegetation. (3 marks)

- ***Temperatures at the mountain tops are very low to support plant growth.***
- ***The surface is bare rock/absence of soil.***
- ***Absence of moisture for plants due to snow.***
- ***Very high altitude hinders plant growth.***

4. The diagram below shows some karst underground features. Use it to answer question (a).



(a) Name the features marked X, Y and Z. (3 marks)

- ***X – Limestone pillar***
- ***Y – Stalactite***
- ***Z – Cave/cavern***

(b) State **three** conditions necessary for the development of a karst landscape. (3 marks)

- ***The surface rock and that below should be thick limestone, chalk or dolomite.***
- ***The rock should be hard and well jointed***
- ***The climate should be hot and humid***
- ***Rainfall should be moderate to high***
- ***The water table in the rocks should be deep below the surface***

5. (a) What is soil degeneration? (2 marks)

Soil degeneration is the decline in the usefulness of soil due to environmental factors and human activities.

(b) State **three** factors that determine soil colour. (3 marks)

- ***The type of parent rock in an area.***
- ***The amount of organic matter or humus***
- ***The drainage of the soil/amount of water in the soil***
- ***The chemical composition of minerals/degree of concentration of iron oxides***

SECTION B

6. Study the map of Kijabe (1:50,000 sheet 134/3) provided and use it to answer the following questions.

(a) (i) What type of map is Kijabe? (1 mark)

Topographical

(ii) Give the position of Kijabe railway station by latitude and Longitude. (2 marks)

(***$0^0$55' South, $36^0$35' East)*** ***or***

Latitude $0^0$55' South.
Longitude $36^0$35' East

(iii) Identify **two** human made features at grid square 2693. (2 marks)

- ***Telephone line***
- ***Power line***
- ***A permanent building***
- ***A major fence/hedge/wall***
- ***A main track road/motorable road.***

(b) (i) What is the four figure grid reference of Kagwe Carbacid plant? (2 marks)

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(ii) Citing evidence from the map, give three social services offered in the area covered by the map. (3 marks)

- ***Education due to presence of many schools***
- ***Medical services due to presence of Kijabe hospital and dispensaries near Kereita and at Kinale***
- ***Religious services due to presence of a church at Kambaa.***

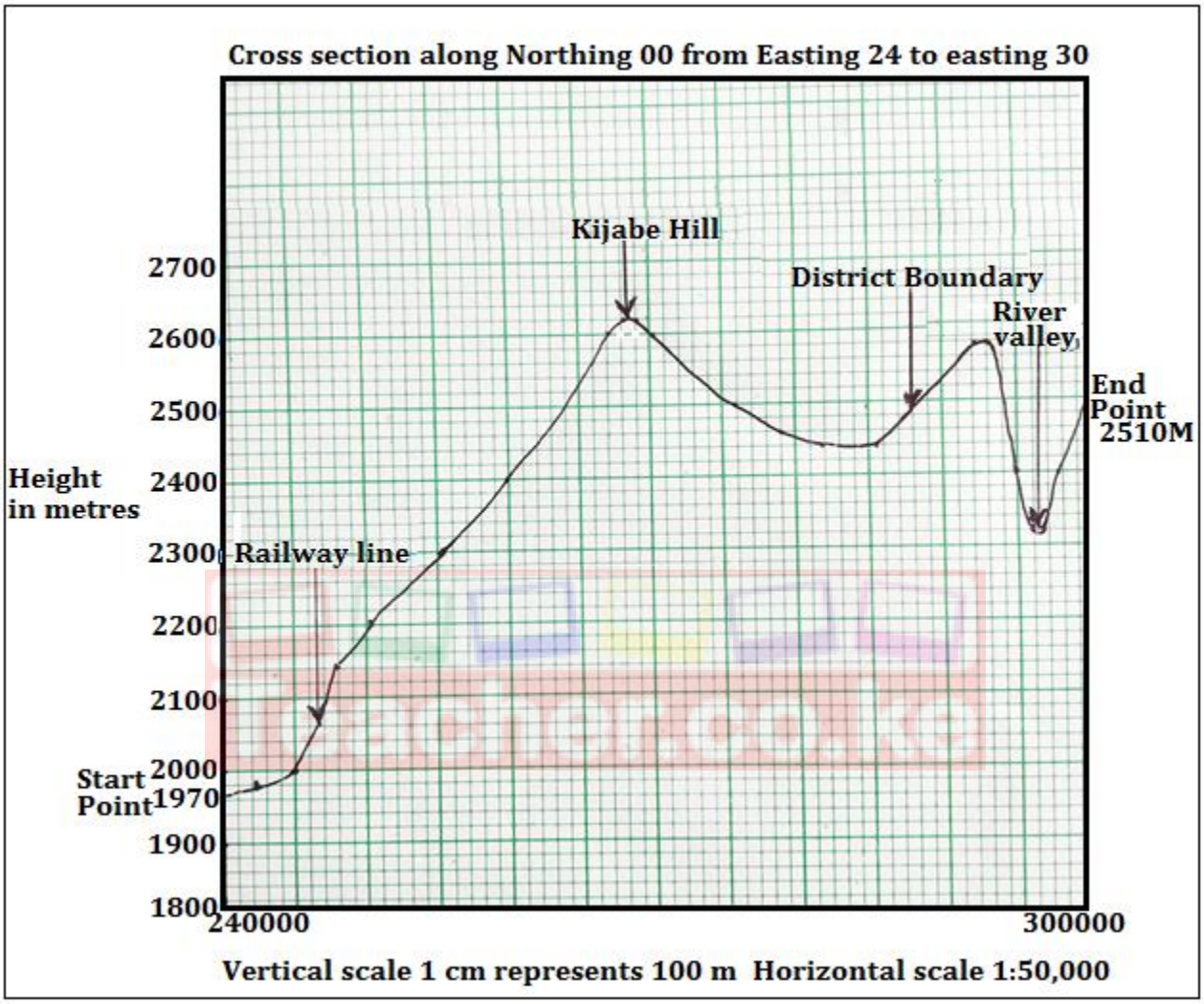
(c) Describe the distribution of natural vegetation in the area covered by the map. (5 marks)

- ***There is a bamboo forest east of Kinari in the northern parts.***
- ***A large section of the eastern parts are covered by Wakagwe forest.***
- ***A section of Nyamweru forest occurs on the south western parts/near Kambaa.***
- ***There is a thicket in the southern parts.***
- ***Most western parts have scrub vegetation especially along Ewaso Kedong Valley.***
- ***There is a woodland around the hot springs at grid square 3297.***
- ***A mixture of scattered trees and scrub is evident around Kinari in the Northern parts.***

(d) (i) Using a vertical scale of 1cm to represent 100 metres, draw an accurate cross section along northing 00 from easting 24 to easting 30. (4 marks)

(ii) On the cross section, mark and name:
- Kijabe Hill
- A railway line
- A district boundary
- A river valley

(4 marks)



(iii) Calculate the vertical exaggeration of the cross section. (2 marks)

VE = ***Vertical scale*** = ***1cm represents 100 M***
Horizontal scale ***1:50,000***

= ***1:10,000***
1:50,000

= ***1*** X ***50,000***
10,000 ***1***

= ***5 or 5 times***

7. (a) (i) Differentiate between equinox and solstice. (2 marks)

Equinox refers to the time of the year when the sun is overhead at noon at the equator while solstice refers to the time of the year when the sun is overhead at the tropics of Cancer and Capricorn.

(ii) Describe how a solar eclipse occurs (4 marks)

- ***A solar eclipse occurs when the sun, the moon and the earth appear along a straight line.***
- ***The moon comes in between the sun and the orbiting earth.***
- ***The moon blocks sunlight from reaching some parts of the earth's surface.***
- ***This forms a shadow called an eclipse on some parts of the earth.***
- ***The totally dark part of the shadow is called umbra while the partially dark shadow is called penumbra.***

(b) (i) State the characteristics of the earth's core. (5 marks)

- ***The earth's core is divided into two parts: inner and outer core.***
- ***The outer core is about 2200km thick.***
- ***Inner core has a thickness of about 1270 km.***
- ***Both the inner and outer core are made of iron and nickel.***
- ***The temperature of the outer core is about 3700^0C.***
- ***The inner core has a temperature of about 5500^0C.***
- ***Materials at the outer core have a density of 11gm/cc.***
- ***The inner core has a density of 17gm/cc.***
- ***The inner core exists in a solid state.***
- ***The outer core exists in a molten state.***

(ii) Explain **two** reasons for the shape of the earth. (4 marks)

- ***Greater speed of rotation at the equator produces or flinging force called centrifugal force that results in bulging at the equator***
- ***The poles are constantly being pulled towards each other by centripetal force which causes flattering at the poles.***
- ***The earth's strong force of gravity pull all objects towards the centre thus the curved shape of the earth's surface***

(c) (i) What is International Dateline? (2 marks)

International dateline is an imaginary line that mainly follows longitude 180^0 passing through the Bering Sea which separates one calendar day from the next.

(ii) Explain how the revolution of the earth causes seasons. (8 marks)

On 21st march, the sun's mid-day position is overhead at the equator for the first time and appears shift thereafter northwards. Its spring at mid and higher latitudes in the Northern hemisphere and autumn in the Southern.

On 21st June, the sun's mid-day position is overhead at the Tropic of Cancer marking the beginning of summer at mid and higher latitudes in the Northern hemisphere and winter in the Southern

On 23rd September, the sun's mid-day position is overhead at the equator for the second time and appears shift thereafter southwards. Its autumn at mid and higher latitudes in the Northern hemisphere add spring in the Southern.

On 22nd December, the sun's mid-day position is overhead at the Tropic of Capricorn marking the beginning of winter at mid and higher latitudes in the Northern hemisphere and summer in the Southern hemisphere.

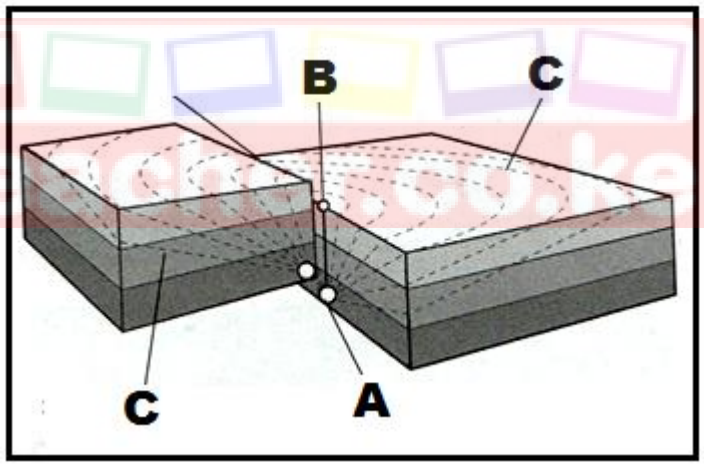
8. (a) Define the term earthquake. (2 marks)

An earthquake refers to a sudden and rapid movement of the earth's crust.

OR

An earthquake refers to violent shaking of the ground due to sudden release of energy from below.

(b) The diagram below represents the occurrence of an earthquake in the crust.



(i) Name the parts marked A, B, and C. (3 marks)

- ***A – Seismic focus***
- ***B – Epicentre***
- ***C – Shock waves***

(ii) Apart from the movement of tectonic plates, state **three** other natural causes of earthquakes. (3 marks)

- ***Violent movement of magma during vulcanicity.***
- ***Energy release from the mantle.***
- ***Collapsing of rocks due to gravitative pressure.***
- ***Vertical earth movements during Isostatic adjustment***

(iii) Explain **two** ways in which the movement of tectonic plates causes earthquakes. (4 marks)

- ***Where two tectonic plates meet, stress builds up especially during subduction. The stress causes rocks on the edges to fracture which releases a lot of energy that triggers an earthquake.***
- ***Where two tectonic plates slide along transform boundaries, friction causes the plates to lock temporarily building stress along the edges. Eventually, rock fracture occurs which triggers vibrations that lead to earthquakes.***
- ***Along extensional boundaries, some rocks along either side of the fault may slip/slide triggering vibrations that cause earthquakes.***

(c) Name **five** features formed due to extrusive vulcanicity. (5 marks)

- ***Acid lava cones***
- ***Basic lava domes***
- ***Ash and cinder cones.***
- ***Plug domes***
- ***Volcanic plugs***
- ***Lava plateaus***
- ***Craters***
- ***Calderas***
- ***Hot springs***
- ***Geysers***
- ***Fumaroles***
- ***Composite/Strato volcanoes***

(d) Explain **four** positive influences of volcanic features to human activities. (8 marks)

- ***Zones with Geysers/fumaroles are a source of geothermal steam which is harnessed to generate electricity for domestic and industrial uses. ✓✓***
- ***Water from Hot springs is used for heating houses especially in winter e.g. in New Zealand. ✓✓***
- ***Volcanic features such as mountains, geysers and plug domes attract tourists who bring in foreign exchange. ✓✓***
- ***Volcanic rocks such as basalt weather to form rich soils with a wide variety of mineral nutrients which support crop farming. ✓✓***
- ***Volcanic mountains receive heavy rainfall on the windward side encouraging farming or settlement. ✓✓***
- ***Windward slopes of volcanic mountains receive high relief rainfall thus key water catchment areas which are a sources of key rivers used for irrigation / hydroelectric power generation / water for domestic and industrial use. ✓✓***
- ***Some volcanic rocks such as Phonolite provides materials for building houses and for road construction. ✓✓***
- ***Crater lakes provide fishing grounds for e.g. Lake Chala / source of water for domestic / industrial use. ✓✓***
- ***Some mofettes are used in extraction/provision of carbon (IV) oxide which is sold to manufacturers of carbonated drinks. ✓✓***

9. (a) (i) What is a lake? (2 marks)

A lake is a mass of water which occupies a depression/basin/hollow on the surface of the earth.

(ii) Give **five** processes that lead to formation of Lakes. (5 marks)

- ***Through earth movements.***
- ***Through vulcanicity.***
- ***Through erosion.***
- ***Through deposition.***
- ***Through mass movement.***
- ***Through weathering by solution.***
- ***Through human activities such as building a dam along a river.***

(b) Describe how Lake Victoria was formed (6 marks)

- ***Internal land forming processes caused vertical earth movements which resulted in down warping of a huge region.***
- ***Down warping led to the formation of a huge depression/basin.***
- ***Uplifting of landmasses around the depression during the formation of the Mau Ranges and the Ruwenzori altered the drainage of the area.***
- ***Some rivers from Kenya which flowed westwards were cut off and diverted into the depression.***
- ***Some rivers in Uganda such as Katonga, Kafu and Kagera were reversed to flow into the depression.***
- ***Deposition of water into the depression caused further downwarping.***
- ***The mass of water which accumulated formed Lake Victoria.***

(c) Explain **three** reasons why some Rift Valley Lakes in Kenya are saline. (6 marks

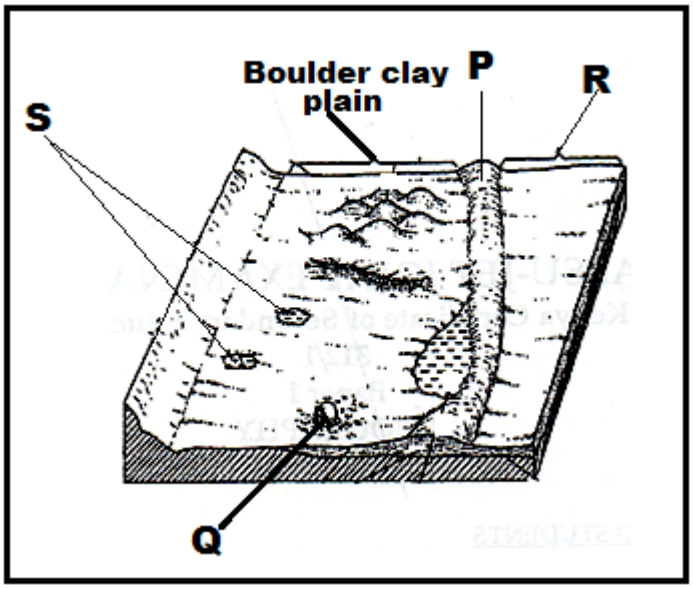
- ***Some rivers and surface runoff flowing over volcanic rocks empty salt solutions in some lakes.***
- ***Some lakes lack surface outlets in form of rivers which lead to accumulation of salts.***
- ***Some lake beds are made of rocks rich in soluble salts where the lake water directly dissolves some salts thus increasing salinity.***
- ***Some lakes are fed by springs rich in salty water which contributes to salinity.***
- ***Some lakes are located in high temperature regions with high evaporation rates thus accumulation of salts.***

(d) Explain **three** ways in which lakes influence the climate of the surrounding areas. (6 marks)

- ***Large lakes contribute large quantities of moisture which aids in the formation of convectional rainfall.***
- ***Lakes increase the absolute humidity of the surrounding area by adding extra moisture through evaporation.***
- ***Lakes facilitate the development of land and lake breezes through creation of pressure differences between water surface and the land surface.***

- ***Air currents from lakes lower the temperature of the surrounding regions during the hot/summer season.***
- ***During winter, lake breezes may bring a warming effect to adjacent regions e.g The Great lakes of North America.***
- ***Land and lake breezes may strengthen or reverse the pattern of prevailing winds over adjacent regions***

10. The diagram below shows some glacial features in low lands.



(a) (i) Name the parts marked P, Q R and S. (4 marks)

- ***P – Terminal moraine***
- ***Q – Erratic***
- ***R – Outwash plain***
- ***S – Kettle lakes***

(ii) Outline **three** factors that cause glacial deposition in lowlands. (3 marks)

- ***Occurrence of gentle slopes.***
- ***The amount of ground moraine.***
- ***High friction on moving ice.***
- ***Changes in weather conditions.***

(b) Describe how a fiord is formed. (6 marks)

- ***Initially, there existed a river valley in a mountainous region near the sea.***
- ***The river valley had well developed interlocking spurs.***
- ***The entire river valley was covered with ice during the period of glaciation.***
- ***The river valley was eroded through plucking and abrasion.***
- ***The former interlocking spurs were trimmed through plucking and abrasion forming truncated spurs.***
- ***Plucking process straightened and widened the river valley while abrasion greatly deepened it.***
- ***The eroded materials were deposited towards the sea side.***

- ***When ice melted, a wide, flat bottomed valley with steep sides called a glacial trough was formed.***
- ***When the sea level did rise, the entire glacial trough was submerged up to far inland forming an inlet called a fiord/fjord.***

(c) Explain how glaciation influences the following features influence human activities.

(i) Mining (2 marks)

- ***Ice sheets in their scouring effects reduce lands surface and depth to expose mineral seams which become easy to mine***
- ***Some minerals may be buried deep underneath the moraine making it difficult /expensive to mine.***

(ii) Agriculture (4 marks)

- ***Some boulder clay plains, outwash plains and old glacial lake beds have very rich deposits that favour crop farming.***
- ***Glaciated valleys have good pastures that favour transhumance in some countries.***
- ***Some boulder clay deposits create a swampy land which hinders agriculture.***
- ***Glacial deposits lead to the formation of numerous glacial lakes thus reducing the arable land in some countries.***
- ***Alluvial fans within some glacial troughs are good sites for Agriculture because of fertile.***

(iii) Fishing (2 marks)

- ***Some cirque lakes/tarns offer suitable areas for trout fish farming example on the slopes of Mount Kenya.***
- ***Lakes formed through glaciations such as moraine dammed lakes can be exploited for various economic uses such as fishing.***
- ***Some fiords form deep and well sheltered waters favouring fish breeding thus excellent fishing grounds.***

(d) Students of Nanyuki High School carried out a field study on glaciation on Mt. Kenya

(i) State **two** reasons why they conducted a reconnaissance. (2 marks)

- ***In order to prepare a budget for the study***
- ***In order to formulate the objectives / hypotheses for the study***
- ***In order to prepare a route map***
- ***In order to assess the suitability of the area for the study***
- ***In order to identify possible challenges and seek ways to deal with them.***
- ***To identify possible routes to be followed during the study.***
- ***To enable them to prepare a work schedule.***
- ***To identify and introduce themselves to a resource person/guides.***
- ***To familiarize with the area of study.***

(ii) Give **two** methods that they would use to collect data. (2 marks)

- ***Observation.***
- ***Taking measurements such as on temperature and altitude***
- ***Interviewing.***
- ***Photographing.***