**321/1**

**GEOGRAPHY PAPER 1**

**FORM FOUR**

**2 ¾ HOURS**

**KENYA CERTIFICATE OF SECONDARY EDUCATION**

**GEOGRAPHY PAPER 1**

**MARKING SCHEME**

1. **a) Name two planets without satellites. (2mks)**

* mercury
* venus **(2×1=2mks)**

**b) State three characteristics of the inner core. (3mks)**

* it is made up of iron
* it has very high temperatures estimated to be between 4500oC
* it has average density of between 16-17gm/cc/has very high density
* it is solid in nature **(any 3×1mk=3mks)**

1. **a) Give two local winds that are found in Kenya. (2mks)**

* anabatic winds
* katabatic winds
* sea breeze
* land breeze **(Any 2×1mk=2mks)**

**b) State three conditions necessary for formation of dew. (3mks)**

* day time should be warm to facilitate evaporation
* the air should be calm
* the temperatures should be low below dew point
* the sky should be clear/cloudless at night. **(Any 3×1mk=3mks)**

1. **a) Define a lake. (2mks)**

* It is a body of water which occupies a basin, depression or hollow on the earth’s surface. **(1×2=2mks)**

**b) State three reasons why some rift valley lakes have fresh water. (3mks)**

* They have surface and subterranean outlets through which excess salts deposits are carried away.
* They have regular inflow of fresh water from rivers which dilute the salts, keeping the water fresh.
* They are situated in areas of high rainfall, which keep this water fresh
* They are isolated in areas of low temperatures, resulting in low rates of evaporation, therefore low salt concentration. **(Any 3×1=3mks)**

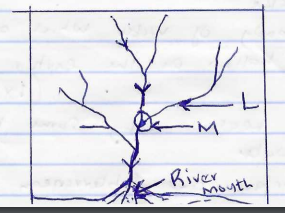
1. **a) Give two main components of soil. (2mks)**

* inorganic matter
* organic matter
* soil water/moisture
* soil/air **(Any 2×1=2mks)**

**b) State three factors that favour soil erosion.**

* Steep slope
* Fine textured soil e.g. volcanic ash
* Absence of vegetation cover
* High rainfall **(Any 3×1=3mks)**

1. **The diagram below shows a river and its tributaries. Use it to answer question 5(a)**



1. **Name the parts marked L and M. (2mks)**

L – Tributary

M – Confluence **(2×1mk=2mks)**

1. **State three factors that influence river deposition. (3mks)**

* Reduction/reduced gradient/velocity
* Decrease in river volume
* Nature and amount of load
* Presence of obstacles in the river channel
* Widening of the river channel
* River entering into a calm water body/lake/sea
* Freezing of river water. **(Any 3×1mk=3mks)**

**SECTION B**

**Answer question 6 and any other two in this section**

1. **Study the map of Kijabe provided (1:50,000) and use it to answer the questions that follow.**
2. **i) State one method of representing relief used in the map extract**.

* Contours
* Trigonometrical station and spot height. **(1×1mk=1mk)**

**ii) Give the six figure grid reference of the cattle dip near Kenton. (2mks)**

* 279014 **(1×2mks=2mks)**

**iii) Give the longitudinal extent of the map extract. (2mks)**

* From 36o 30oE to 36o 451E **(1×2mks=2mks**)

1. **i) Calculate the area to the south of the power line giving your answer in Km2 (2mks)**

* Full squares =16
* Half squares =28 =28/2=14 full squares.

Total area =16+14=30km2 (+0.5km2) **(1×2mks=2mks)**

**ii) Describe the settlement distribution in the area covered by the map extract.**

**(5mks)**

* There are no settlements within the Ewaso Kadong valley
* There are nucleated settlements in the markets/shopping centres/villages
* Some areas with steep slopes/ridges/river valleys/kijabe hill have fewer or no settlement
* There are fewer settlement within the forest
* Kinale/Kinari forest station has dense settlement.
* There are no settlements within the plantations
* There are few settlements to the west of Naivasha-Narok road.
* The area covered by the map is generally sparsely settled.
* There are linear settlements along some roads.

**(Any 5×1mk=5mks)**

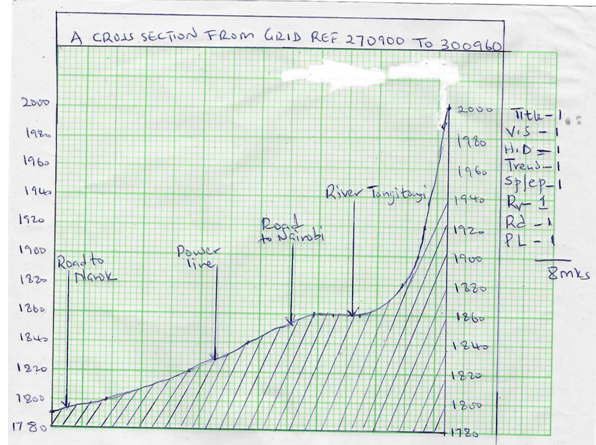
1. **Explain three factors favouring cattle rearing in the area covered by the map. (6mks)**

* The presence of scrub and scattered trees show that there is natural pasture for cattle.
* The presence of many rivers/sources of water show that there is adequate water for cattle.
* The area has high attitude/above 1000m which provide cool conditions suitable for cattle rearing.
* The many cattle dips for controlling ticks/parasites which attack cattle show that there is access to veterinary services.
* There are large tracks of land with few settlements ensuring extensive areas available for grazing.
* Availability of transport as evidenced by roads/railway line for movement of cattle/cattle products.
* Dense settlements in some areas provide market for cattle/cattle products

**(Any 3×2mks=6mks)**

1. **Draw a cross section from grid reference 270900 to 300960. On your cross section label and name**

* Tarmac rod
* Power line
* River Tongitongi



**T**- Title ,**V.S**- vertical scale, **H.D**- Horizontal distance, **ST/EP**- Starting point(1780- 1800m) And End point ( 2000m), Rv- River, Rd- road( Any road), PL- Power line

1. **a) i) Differentiate between weathering and mass wasting. (2mks**)

* Weathering is the mechanical breakdown or chemical decay of rocks in situ while mass wasting is the movement of weather rock materials down a slope under the influence of gravity. **(2mks)**

**ii) Name two types of landslides. (2mks)**

* slump
* debris slide
* debris fall
* rock fall
* rock slide (**Any 2×1mk=2mks)**

**iii) Other than water, identify three other weathering agents. (3mks)**

* heat
* dissolved substances
* plants
* animals
* people
* gases eg. Co2, O2 **(Any 3×1mk=3mks)**

**b) i) Explain how the following process of weathering take place**.

**- Exfoliation**

* During the day, the rock surface is heated more than the inner layers because rocks are bad conductor of heat. The surface expands more than inner layers creating a strain between the two layers.
* At night the surface cools faster than the inner layers.
* With time the outer layer develops cracks and later frees off and pieces of rock fall down by gravity. **(3mks)**

-**Carbonation**

* Rain water mixes with carbon dioxide in the atmosphere to form a weak carbonic acid.
* The carbonic acid reacts with calcium carbonate in calcareous rocks (limestone, dolomite, chalk) to form calcium bicarbonate.
* Calcium carbonate is soluble and it is removed from the rock in solution. **(3mks)**

**ii) Explain how the following factors influence mass wasting.**

* **Climate**
* Heavy rain or alternate freeze and thaw periods encourage movement of materials
* Areas with high rainfall records have wet materials which are easily moved under gravity. **(any 2×1mk=2mks)**
* **Slope**
* There is faster movement of materials on steep slopes compared to gentle slope/low lying plain. (**1×2mks=2mks**)

1. **i) Describe the process of solifluction. (3mks)**

* it occurs in mountaneous and cold climate areas
* in cold seasons, the soil water get frozen. When the warm season sets in frozen water in the top soil thaws and subsoil remains frozen.
* The top soil gets saturated with water, making it slide over the frozen subsoil. This movement is called solifluction. **(1×3mks=3mks**)

**ii) State two causes of soil creep. (2mks)**

* Ploughing downhill cause soil to shift down slope.
* Earthquakes shakes the crustal rocks causing soil particles to move downwards
* Temperature changes makes soil particles to expand and contract
* Trampling and burrowing of animals. **(any 2×1mk=2mks)**

1. **Students of Makuyu Boys carried out a field study on weathering in a limestone area.**
2. **Name two surface features they may have identified. (2mks)**

* Grikes
* Clints
* Dolines
* Swallow holes/sink holes
* Uvala
* Polje
* Dry river valley. **(Any 2×1mk=2mks)**

1. **State one effect of weathering on human activities (1mk)**

* It leads to formation of soils useful for agriculture.
* It may break rocks which contain minerals which man can exploit
* It produces clay and bauxite which can be used in pottery and manufacture of aluminium
* It weaken rocks which moltens quarrying easier **( 1MK)**

1. **a) i) What is a piedmont glacier. (2mks)**

* This is a glacier formed when several valley glaciers flow and coalesce downhill to the lowland to form a large mass of ice. **(2mks)**

**ii) State two conditions favouring the formation of glaciers**

* existence of very low temperatures below 0oC which allow formation of ice and snow
* Abundant and constant supply of snow fall that exceeds snow melting. **(2×1mk=2mks)**

**b) Explain the following ways of ice movement. (2mks)**

**i) Basal slip**

* this is where a glacier slides/slips over the overlying rocks due to gravity
* Melt water at the base of the glacier resulting from pressure exerted by the glacier at the base acts as a lubricant between the ice and at the underlying rock. (2×1-2mks)

**ii) Plastic flowage (2mks)**

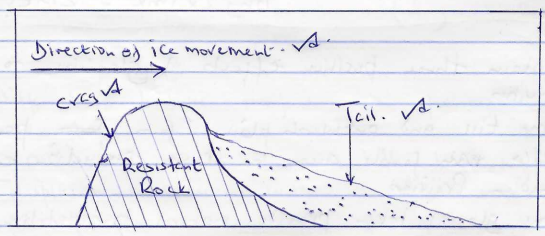
* This is the flow of ice as a viscous liquid resulting from thawing of ice in the lower layers caused by the weight of the overlying layers of ice. (1×2=2mks)

**c) i) State two processes of glacier erosion. (2mks)**

* Plucking
* Abrasion **(2×1=2mks)**

**ii) Using a well labeled diagram describe the formation of crag and tail. (7mks)**

* A resistant rock (crag) lib on the path of a glacier
* A glacier passes over and around the rock
* The glacier is only able to slightly erode the rock
* The materials that are carried by the glacier are deposited on the lee side of the resistant rock (downstream side)
* The upstream side of the resistant rock is eroded slightly forming the crag and the downstream side when there is deposition forms the tail



**(Explanation 4mks diagram 3Mrks= 7Mks)**

1. **Apart from crag and tail state two glacial depositional featutes. (2mks)**

* Terminal moraine
* Drumlins
* Kame
* Outwash plain
* Esker
* Eratics
* Till/boulder clay
* Boulder train **(Any 2x1mk=2mks)**

**d) Explain three positive effects of glaciations to human activities.**

* Some till and outwash plains form part of the world’s fertile areas for crops production eg the Canadian prairies.
* Some glacial lakes provide natural transportation routes eg the Great lakes of North America
* Waterfalls from hanging valleys can be used to produce hydroelectric power (HEP). The power can be used to run machines industries.
* Erosion by continental ice sheets expose minerals such as iron and gold in the Canadian Shield, for easier exploitation.
* Melt water from glaciers gives rise to rivers that provide water for irrigation, domestic/industrial use, products on of HEP
* Glaciated highlands especially mountains are attraction sites for tourists. Winter sports such as skiing are major attractions on the Alps in Switzerland.
* Sand for building and construction is excavated from outwash plains, eskers and kames. **(any 3x2mks=6mks)**

1. **a) i) Differentiate between orogenic and epeirogenic earth movement. (2mks)**

* orogenic earth movements are the horizontal/lateral displacements occurring within the crustal rocks due to tectonic forces while epeirogenic earth movements are the vertical displacements occurring within the crystal rocks due to tectonic movements. **(1x2mks=2mks)**

**ii) Describe the origin of continents according to the theory of plate tectonics. (4mks)**

* the earth lithosphere/crust is divided into several rigid blocks called tectonic plates.
* The plates float on semi molten mantle that lies beneath
* The plates move horizontally due to convectional currents within the mantle in three ways; towards one another, away from one another or side by side parallel to each other
* The plates form distinct boundaries along the plates margins. Each continent sits on a tectonic plate. **(4x1mk=4mks)**

**b) i) Apart from an over thrust fold, name three other types of folds.**

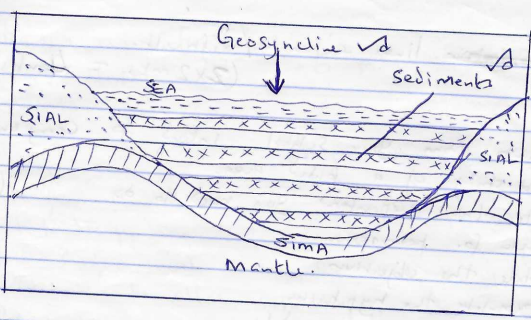
* Simple fold/symmetrical fold
* Asymmetrical fold
* Over fold
* Isoclinals fold
* Recumbent fold
* Over thrust fold/nape fold
* Anticlinorium and synclinorium complex fold.

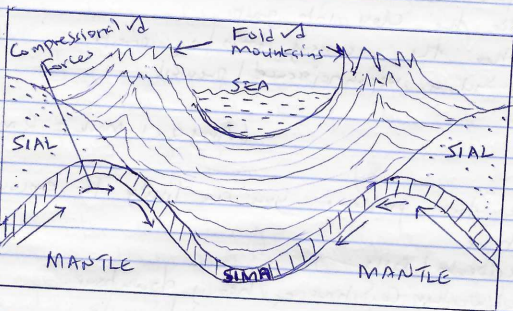
**( 3 x 1 = 3Marks)**

**ii) Using well labeled diagrams, describe how Fold Mountains are formed.**

**(8mks)**

* Compressional force lead to the formation of a large depression called a geosynclines
* Water collects in the geosynclines to form a sea.
* Prolonged and extensive erosion occurs on the surrounding higher lands and the sediments are deposited in geosynclines forming a thick deposit
* The weight of the sediments causes subsidence of the geosyncline leading to accumulation of more sediments to great thickness.
* Further subsidence of the geosyncline triggers off compressional forces which cause the sediments to fold.
* The folded layers of sediments in the geosyncline are thrust upwards to form Fold Mountains along the edges of the geosynclines.





**Text – 4**

**Diagrams – 4 = 8mks**

**c) Explain two negative effects of folding to human activities.**

* Leeward slopes of fold mountains receive little or no rainfall/experience dry conditions which discourage settlement/crops farming.
* The rugged nature of folded landscape discourage settlement
* Fold mountains are barrier to transport/make construction of transport lines expensive/difficult. **(Any 2x2=4mks)**

**d) Students from your school intend to carry out a field study of a folded area.**

**i) State two preparations you need to do. (2mks)**

* Seek for permission
* State the objectives
* Formulate the hypothesis
* Prepare a working schedule
* Divide the class into groups
* Gather the necessary tools/equipment
* Conduct a reconnaissance/previsit **(any 2x1=2mks)**

**ii) State two problems you are likely to encounter. (2mks)**

* Fatigue
* Accidents/falls
* Bad weather conditions eg heavy downpour
* Attack by dangerous animals/insects
* Uncomperative respondents.
* Difficulties in climbing activities. **(any 2x1mk=2mks)**

1. **a) i) Apart from stalagmite Identify two underground features in a Karst scenery. (2mks)**

* Limestone pillars
* Cave
* Stalagmite
* Stalactite **(any 2x1mk=2mks)**

**ii) State three conditions necessary for the formation of a Karst landscape. (3mks)**

* The surface rock should be thick limestone, chalk or dolomite to allow solubility of water.
* The rock should be hard, well jointed to allow rainwater to percolate through the lines of weaknesses
* The place should be hot and humid to facilitate chemical weathering/carbonating/solution to take place.
* The water table should be far below the surface to allow formation of features

**(Any 3x1mk=3mks)**

**iii) Describe the formation of a stalagmite. (5mks)**

* Rainwater dissolves/absorbs carbon dioxide (Co2) in the atmosphere to form weak carbonic acid. (H2CO2)√
* Carbonic acid falls on a jointed limestone rock below which is a cave√.
* The carbonic acid percolates through the joints reacting with calcium carbonate in the limestone rock forming calcium bicarbonate/calcium hydrogen carbonate which is soluble.√
* The solution drips to the floor of the cave from the roof.√
* Some of the water evaporates and CO2 is released leaving behind deposits of calcium carbonate which grows upwards from the floor of the cave.√
* With time, the calcium carbonate accumulate and eventually lead to the formation of fingerlike projections on the floor of the cave called stalagmites.√

**(5mks) NB Sequence must be followed**.

**(At the last point must be mentioned to score max points)**

**b) i) Name two water erosional features on a desert. (2mks)**

* Landscape
* Mesas/buttes
* Gorges/canyons
* Wadins
* Dry river valleys/laghas
* Inselbergs **(any 2x1mk=2mks)**

**ii) Describe the formation of a rock presestal. (5mks)**

* A rock with alternating hard and soft layers lies on the path of wind.
* Wind abrasion attacks the rock eroding the softer layers faster than the hard layers.
* Abrasion is greater near the ground due to the heavier materials transported by wind
* The softer layers are eroded to form hollows and the hard layers are left as protrusions
* This leads to the formation of an irregular rock pillar with a narrow base called a rock pedestal.

**c) Explain four significance of desert land forms to human activities. (8mks)**

* Desert features eg Zeugen, yardangs, rockpedestals, are tourist attraction sites. Tourists bring in foreign exchange.
* Deflation hollows may contain water used for domestic us, irrigation/watering livestock.
* Loess resulting from wind depositions forms fertile soils for crops farming.
* Seasonal streams in the deserts may be dammed to provide water for irrigation during dry seasons
* Desert landscape/areas are ideal sites for testing militants weapons and military training.
* Sand dunes may cover roads making transport difficult
* The wadis/bad lands make transport facilities difficult and expensive to construct.
* The desert has high solar isolation which can be harness for solar energy production. This can be used to light homes and run industries.
* Desert scenery provide good site for shooting films
* Flash floods in the desert areas cause deaths when people are carried away by water that furiously flow through the wadis
* Rocky deserts surfaces discourage settlements. **(any 4x2mks=8mks**)