KENYA NATIONAL EXAMINATION COUNCIL

KCSE 2009

GEOGRAPHY

PAPER 1

MARKING SCHEME

SECTION A

1. (a) **Differentiate between the process of formation of plutonic and volcanic rocks**

- Plutonic rocks form from magma which cool's slowly and solidifies within cracks and chambers in the earth's crust while volcanic rocks form from the lava that cools fast and solidifies onto the surface of the earth.

(b) For each of the following sedimentary rocks, name the resultant rock that forms after metamorphism

(i) Sandstone - Quartzite/ late

(ii) Limestone - Marble

(iii) Clay - Slate/ Schist

2. **Use the diagram below to answer the questions that follows**

(See the diagram in the questions paper)

- Outline the process through which moist winds shown go through to eventually become dry winds
- The moist air which is lighter (forced) ascends) the highland in/ the moist air is subjected to prographic force
- The force ascents leads to the expansion of the air
- The moisture in the air condenses forming clouds
- Descending air is dry wind

Any 5 x 1 = 5 mks

3. (a) **What is line of longitude?**

Line based on

It is the angular distance of a place east or west of the Prime Meridian (0^0) it is an imaginary line which is drawn on a map from Prime Meridian (0^0)

(2 mks)

(b) **What is the local time at Alexandra 30^0E when the local time at Malindi 40^0 is 12.00 noon?**

- The differences in degree of longitude between Alexandra and Malindi is 40^0 - $30^0 = 10^0$
- The difference in time between 1^0 longitudes is 4 minutes
- So the total difference in time between the two towns is 10^0 x 4 minutes = 40 minutes.
- Alexandria is west of Malindi so it is behind in time by 40 minutes
- Therefore, the local time at Alexandria is 12.00 – 40 minutes = 11. 20 am

(2 mks)

4. (a) **Outline the steps followed when measuring humidity using a hygrometer**

- Read (and record) Temperature of the West bulb thermometer
- Read (and record) the temperature of dry bulb thermometer
- Calculate the difference in temperature reading of wet and dry thermometers.
- Use the conversation scale o determine the humidity/ interpretation of the temperature differences.

(b) **Give two factors that influence relative humidity**

- Distance from large water bodies/ sea
- Altitude
- Natural vegetation/ forests

- Latitude
- Temperature

Any 2 x 1 = 2 mks

5. **The diagram below shows types of folds. Use it to answer question (a)**

See the diagram on the question paper)

(a) Name the type of folds marked E, F and G

- E - Overfold 225

  F - Recumbent fold

  G - Over thrust fold/ Nape (1 mk)

(b) In which countries are the following fold mountains found

(i) Andes - Chile/ Peru/ Bolivia/ Argentina/ Equador

(ii) Cape Ranges – South Africa

(iii) Alps – Austria/ Switzerland/ Italy/ France

SECTION B

6. Study the map of Belgut 1: 50, 000 (Sheet 117/ 3) provided and answer the following questions.

(a) (i) **Name the three districts crossed by the all- weather road (bound surface) in the north – western part of the map extract**

- Kisumu district
- Homa bay
- Kericho

(ii) Using the marginal information, give the magnetic variation of the area when the map extract was drawn.

(iii) Measure the shortest distance along the loose surface road from the junction at Murumbasi (grid reference 286548) to the school at Chebirbei grid reference 344518). Give your answer in kilometers

0.1 km) 8.4 – 8.6 km

(iv) **What is the approximate height of the papyrus swamp to the north- east of Kabiaranga Farm Institute (grid square 3750).**

Between 1720 and 1780 in above sea level

(b) **Describe the characteristics of the long profile of river Yurith**

- It has two main tributaries, Itare and Kitoi
- River Kitoi flows from the north Eastern direction/ river Itare flows from the south / river Yurith flows westwards.
- The river has many meanders
- The river becomes wider from grid square 3247 just before the bridge
- There are interlocking spurs along the course.
- The river has many small tributaries that form a dendrite/ pattern along the course
- There are rapids/ waterfalls
- Some parts of the long profile have a steep gradient
- There are sand/ mud deposits downstream
- The river is permanent/ premier

(c) **Describe the relief of the area covered by the map**

- The lowest altitude is 1360/ highest altitude is 2020 m
- The land rises from the West to the North East

- the landscape is generally hilly/ has many hills
- There is a main ridge to the East of Sondo River
- There are many interlockings spurs along the river valley
- The landscape is dissected by many river valleys
- There are many, narrow river valleys
- There are numerous steep slopes to the west/ gently slopes to the east

(d) **Citing evidence from the map, explain three factors that favour growing of tea in Belgut area**

- The area experiences cool temperature that favour tea growing due to the high altitude as evidenced by contours that rise above 1700 meters above sea level
- The area receives high rainfall that is adequate for growing tea as evidenced by the presence of forests/ many permanent rivers
- The area has well drained soil suitable for tea growing this is due to the gently sloping, Terrain as indicated by moderately spaced contours
- The area has adequate supply of labour necessary for tea picking evidence by the high density of settlement/ labour lines
- The area has well development transport network for transporting tea leaves to the tea factory evidenced by road and tracts

7. **The diagram below shows a hydrological cycle**

See question paper

(a) (i) **What do the arrows labeled K, L and M on the cycle represents?**

K- Radiation/ half from the sun/ sun's rays/ in solution

L- Percolation/ Underground water

M Evapotraspiration / Evaporation/ water vapour

(ii) **Explain the factors that influence the occurrence of surface- off**

- Amount of water/ nature of rainfall- there should be sufficient rainfall to make the soil saturated in order to allow the excess water to flow on the surface/ intense rainfall accelerates the rate of surface run off be steep 15
- Gradient of the land- The gradient of the slope should be steep to allow flow of water by gravity
- Nature of rocks/ soils- The rocks/ soil should be responsible to allow for limited infiltration and percolation for the excess water to form surface run- off
- Water table/ level of saturation – the water table should be high to reduce infiltration and allows surface run- off

(b) (i) **what is mass wasting?**

- It is the movement of weathered/ rock material down the slope under the influence of gravity

(ii) **Give two processes of slow mass movement**

- Soil creep
- Talus creep/ screen creep
- Solifluction
- Rock creep

(iii) **State two physical conditions that may influence Landslides**

- Steep slopes which allow soil to move down slowly

- Presence of loose soil/ absence of firm rock which means that soils are easily destabilized
- Occurrence of earthquakes which interferes with stability of soils
- Heavy rain facilities movement of material/ down slope.

Any 2 x 1= 2 mks

(c) **Describe the following processes of mass wasting**

(i) **Rock Fall**

- It occurs where rocks are well jointed and with steep slopes. Rocks parts are detached from the steep slopes and fall rapidly at the base of slope/ frequent freeze- thaw action on steep slope/ produces particles which get detached and fall at the base of rock face.

(ii) **Subsidence**

- Subterranean weathering leads to formation of caves/ cavers. Where the roof is too heavy to remain suspended, it collapses vertically.

(iii) **Mud flows**- wet and loose soil materials saturated with water will move down the hill. (As the semi- liquid mud collects more materials it comes rest at the roof of the slope.

(d) **Explain the effect of mass wasting on the following**

(i)	Tourism	Features created through mass wasting are tourist Attractions
(ii)	Soil & Fertility	Mass wasting facilities soil leading to soil Degeneration/ may lead to formation of fertile soil where such soils are deposited.

8. (a) (i) **Name three type of faults**

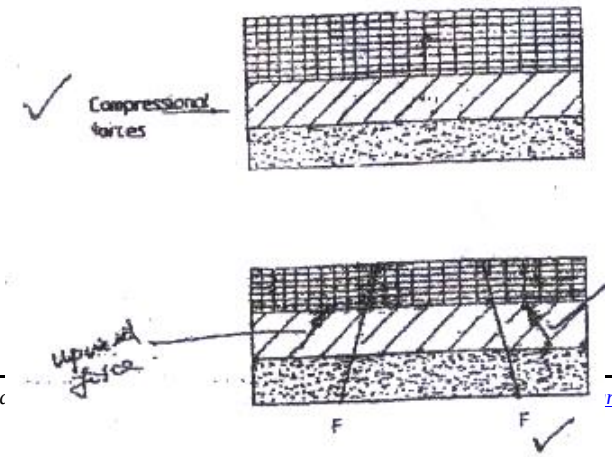
- Normal fault
- reverse fault
- Tear/ shear fault/ slip/ transform/ wrench/ strike slip
- Thrust fault
- Ant clinical fault

(ii) **Apart from compression forces explain two other processes that may Cause faulting**

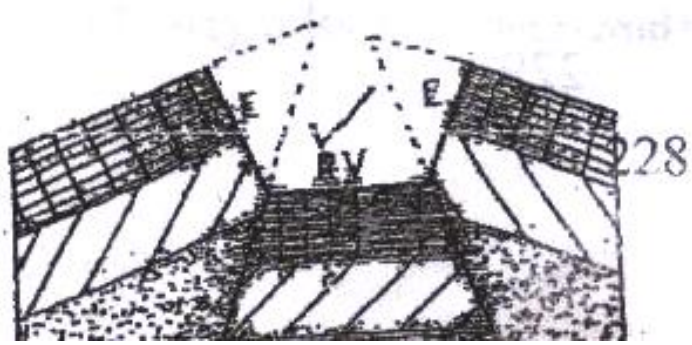
- Faulting may be caused by force acting horizontally away from each other which cause tension in the crystal rocks. Due to tensional forces the rocks stretch and fracture causing faults
- Faulting may occur where horizontal forces act parallel to each other in the opposite/ same direction resulting in shearing
- Faulting may also occur due to vertical movements which may exert a strain in the rocks making them to fracture.

(b) With the aid of diagrams, describe how compression forces, may have led to the formation of the Great Rift Valley

- Layers of rocks are subjected to compression forces



Two parallel lines of weakness development and these reverse faults



Compression forces may push the outer blocks towards each other the outer ride over the middle block) the middle block sinks/ subside/ may remain stable

- The sunken middle part forms a depression called a rift valley
- Layer Diagrams 4 mks)
- Fault line explanations (5 mks)
- Compression
- Upward force
- Rift Valley

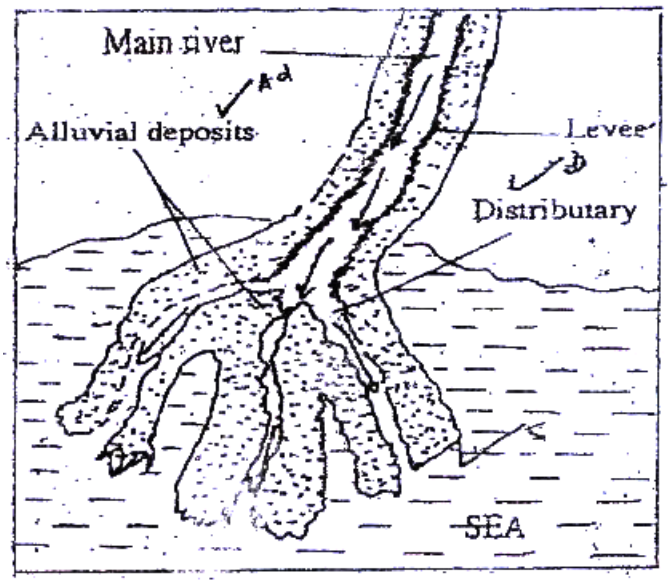
(c**) Explain five ways in which faulting is of significance to human activities**

- Faulting leads to formation of features that form beautiful scenery which attract tourists

- Faulting leads to formation of lakes that are important fishing grounds/ tourists sites / mining sites/ provide water for irrigation/ for domestic use/ industrial use.
- Faulting causes displacement of rocks which exposes minerals that are mined
- Faulting may lead to the formation of mountains/ horst which attract rainfall that give rise to rivers which provide water for industrial/ domestic/ agricultural use/ industrial use for production of H.E.P
- Block mountains formed through faulting lead to formation of relief rainfall on the windward side which favours agriculture/ and settlement / forestry
- Subsidence of land as a result of faulting may lead to loss of life and property
- Springs occurring of the foist of fault scarps attract settlements
- Faulting creates deep faults which are passages of stream jets which may be utilized for geothermal power production
- Rivers flowing over fault scarps may form waterfalls
- When faulting occurs across a ridge it may provide a dip which could form a mountain pass where transport and communication lines can be constructed/ may hinder development of transport.

9. (a) (i) **Apart from Bird's foot delta, name two other types of deltas?**
   - Arcuate delta
   - Estuarine delta
   - Cuspate delta

   (ii) **Draw a diagram to show a bird's foot coastal delta**



SHAPE birds foot

(ii) **Describe how a bird's foot delta is formed**

- It forms at river where waves, tides and currents are very week
- Deposition of large amounts of fine sediments occurs at the river mouth
- The deposits block the channel of the river
- The river divides into few distributaries
- Each distributary's continues to deposit its load maintaining levees as it extends into the sea.
- Some distributaries extended further than others creating the shape of a bird's foot

(b) **Explain four factors that influence the development of coasts**

- Climate of an area will determine the growth of coral polyps. Coral coats develop in tropical regions of the world/ fiord coats were formed as a result of ice erosion in areas that experienced very cold climates

- Nature of the coastal rocks will either encourage rapid erosion or reduce the speed of erosion. Hard rocks result in the formation of cliffs while less resistant rocks results in the formation of inlets/ bays
- The gradient of the coast slope of the coast influence the development of coasts steep coasts encourage wave erosion resulting in the formation cliffs and wave cut platforms/ gently sloping coasts because increased deposition resulting in the formation of beaches
- Alignment of the coast in relation to the prevailing winds will either cause wave erosion or deposition
- The rise in the level of the sea results in drowning features along the coast to give rise to new feature/ landforms the fall in the sea level exposes features that were once covered by the water
- Human activities interfere with the natural state and appearance of the coasts
- Nature of waves- where waves are destructive the West is characterized by erosion/ features/ where waves are constructive the coast is characterized by depositional/ features

(c)(i) **Differentiate between a barrier reef and a fringing reef**

- A barrier reef is formed a long distance away from the sore and is separated from the shore by a wide lagoon whereas a fringing reef is closer to the shore and is separated from the shore by a shallow lagoon

(ii) **The diagram below represents some coastal features. Name the features marked P, Q and R**

(See question paper)

P - Blowhole

Q - Cave

R - Cliff

(iii) **State three conditions necessary for the formation of a beach**

- A gently sloping land at the sea shore
- The shore should be shallow
- Strong swash/ constructive waves/ weak backwash/ wave deposition should exceed erosion
- Waves should carry a lot of materials to be deposited

10. **The diagram below represents underground features in a limestone area. Use it to answer question (a)**

See question paper

(a) (i) Name the features marked X, V and W

X - Stalactite

V - Stalagmite

W - Cave

(ii) **Describe how the features marked Y is formed**

- Solution of solution carbonate trickles down slowly through the roof of a cave/ cavern
- Solution droplets hang on the roof of the cave
- Water evaporates and calcium carbonate it is precipitated

- The precipitated calcium carbonate gradually builds downwards over a period of time as the solution continues to drip from the roof. This forms a stalactite
- The solution splashes on the floor and water evaporates
- The calcium carbonate in it precipitates and gradually builds upwards to form a stalagmite.
- Over time, the stalactite and the stalagmite join to form a pillar/ column

(b) (i) **What is an artesian basin**

- It is a saucer – shaped depression consisting of layer of permeable rock lying between two layers of impermeable rocks, with part of permeable rock exposed to the surface along the edges of the basin.

(ii) **Explain three factors which influence the formation of features in limestone areas**

- The surface rock must be thick limestone to allow solubility by rainwater
- The rock should be hard and well jointed to allow water to percolate through the lines of weakness
- The climate should be hot and humid to facilitate chemical reaction/ weathering/ carbonation.
- The water table should far below the surface to allow for the formation of the features

(Any 3 x 2 = 6 mks)

(c) **You are supposed to carry out a field study of an area eroded by water**

(i) Give three reasons why you would need a map of the area of the study

- To show the extent/ delimit the area of the study
- To show the route to be followed during the study
- To show drainage features
- To be able to estimate distances
- To show the general nature of the terrain

(ii**) Name two erosion features you are likely to identify the field study**

- Exposed rocks
- Ridges / clients
- Gullies/ wades/ grikes/ dry river bed
- Earth pillars

(iii) **State three recommendations that you would make from your study to assist the local community to rehabilitated the recorded area**

- Building of gabions
- Constructing of terraces
- Planting trees
- Adapting farming methods that allow conservation of soil. i.e. planting of over crops / mulding/ strip farming.

Any 3 x 1 = 3 mks)