312/1
GEOGRAPHY
Paper 1
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KASSU-JET JOINT EXAMINATION

Kenya Certificate of Secondary Education

312/1

Paper 1

GEOGRAPHY

MARKING SCHEME

SECTION A

*Answer **all** the questions in this section.*

1. (a) Differentiate between a Star and a Natural satellite. (2 marks)

- ✓ *A star is a heavenly body possessing its own light which it transmits while a natural satellite is a celestial body that orbits a larger celestial body/ a planet.*

(b) State *three* weaknesses of the Passing Star Theory. (3 marks)

- ✓ *Chances of another star approaching the sun is minimal*
- ✓ *The high temperature materials drawn from the sun /star would disperse rather than condense.*
- ✓ *Does not explain where the sun and the star came from.*

2. (a) Give *three* ways in which igneous rocks are classified (3 marks)

- ✓ *Mineral/chemical composition*
- ✓ *depth*
- ✓ *mode of formation*

(Any 3x1=3mks)

(b) Describe how Dynamic metamorphism leads to formation of metamorphic rocks. (2 marks)

- ✓ *The weight of the overlying rocks exerts a lot of pressure on the lower layers.*
- ✓ *This leads to change in the grain/rock structure, so the physical appearance and the character of the rocks change.*

3. (a) Give *three* agents of Weathering. (3 marks)

- ✓ *Heat*
- ✓ *Water*
- ✓ *Air*
- ✓ *Dissolved substances/acids*
- ✓ *Plants and animals.*

(Any 3x1=3mks)

**** Do not award temperature in place of heat****

(b) State how topography influences Weathering of rocks. (2 marks)

- ✓ *Weathering is faster on steep slopes because the rocks are exposed since the weathered materials are removed faster by gravity.*
- ✓ *On gentle slopes and flat areas the rate of weathering is slow because weathered materials cover rocks beneath.*

(2x1=2mks)

4. (a) State the characteristics of Bird's foot delta. (3 marks)

- ✓ *Forms a shape like the foot of a bird.*
- ✓ *Made up of fine alluvium.*
- ✓ *Has a finger-like projection into the sea.*
- ✓ *Has few distributaries (3-4).*
- ✓ *Forms where the waves and currents are very weak.*

(Any 3x1=3mks)

(b) Describe radial drainage pattern. (2 marks)

- ✓ *Formed where rivers flow from one central point e.g a mountain /highland*
- ✓ *The rivers flow in all directions from the central point.*
- ✓ *Is influenced by the rock structure and the slope.*

5. (a) What is Glaciation? (2 marks)

- ✓ *This is the process by which moving ice erodes transports and deposits materials on the earth's surface.*

(b) State *three* factors that influence glacial erosion. (3 marks)

- ✓ *Nature of the underlying rock*
- ✓ *The speed of the moving ice*
- ✓ *Availability and amount of debris in the moving ice.*
- ✓ *Thickness and weight of the ice.*

- ✓ *Seasonal temperatures changes lead to more erosion during summer when the ice melts.*

(Any 3x1=3mks)

SECTION B

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

6. Study the map of Yimbo 1: 50 000 (Sheet 115/1) provided and use it to answer the questions that follow.

(a) (i) Identify the latitudinal extent of the area covered by the map. (1 mark)

- ✓ *Between latitudes 0^0 00' and 0^0 15' S*

(ii) Give the six-figure grid reference of Ramogi hill. (1 mark)

- ✓ *198996*

(b) (i) Convert the ratio scale of the map into statement scale.(2 marks)

- ✓ *1:50000*
- ✓ *1cm rep 50000cm/ 100000cm*
- ✓ *1 cm rep 0.5 km*

(ii) Calculate the area covered by Lake Victoria to the east of Easting 30 in kilometer square. (2 marks)

- ✓ *Full squares = 14*
- ✓ *Half squares = 34/2*
- ✓ *Total area = 31 km^2*

(c) (i) Draw a cross-section along the Northing 90 and between the Eastings 31 and 37 using a vertical scale of *1 cm represent 20 meters*. (4 marks)

On the cross-section, mark and name:

- Thicket vegetation. **(1 mark)**
- A footpath. **(1 mark)**
- River. **(1 mark)**

(ii) Calculate the vertical exaggeration of the drawn cross-section. (2 marks)

VE= vertical scale/horizontal scale
1/2000/ 1/50000
1/2000 X 50000/1
= X25.

(d) (i) Citing evidence, identify two economic activities carried out in the Yimbo area. (2 marks)

- ✓ *Transport - Loose surface road at grid reference 3890.*
- ✓ *Trade - A market at grid reference 3284.*

(ii) Describe how relief has influenced the distribution of settlements in the area covered by the map. (4 marks)

- ✓ *There is no settlement in depressions due to water logging which makes it difficult to erect houses. Eg. At grid reference 2687.*
- ✓ *There are no settlements in areas with steep slopes since it is difficult to erect houses. Eg on slopes of Ramogi hill*
- ✓ *There are little or no settlements in river valleys since they are prone to flooding which would destroy the settlements. Eg along river Alara Yenga valley.*
- ✓ *There are dense settlements in gentle sloping areas since it is easy to erect settlements. Eg. At GR 3280.*
- ✓ *There is little or no settlements in flat lowland areas due to fear of flooding which would destroy the settlements. Eg at grid reference 3776*

(any 2x2=4marks)

(iii) Describe the characteristics of the long profile of river Yala. (4 marks)

- *It is a permanent river.*
- *There is a papyrus swamp along the river.*
- *The river has man tributaries to the east of easting 36.*
- *Some tributaries join river Yala at an acute angle forming a dendritic drainage pattern.*
- *The river flows from south east to north-west direction.*
- *To the west of easing 36, River Yala is in its old stage as suggested by presence of pronounced meanders.*
- *To the east of easting 36, river Yala is in its mature stage as suggested by presence of gentle meanders and presence of tributaries.*
- *The river valley is wide*

(Any 4x1=4marks)

7. (a) Distinguish between orogenic earth movement and epeirogenic earth movement. (2 marks)

- ✓ *Orogenic earth movement are the displacement of crustal rocks that occur along the horizontal plane while epeirogenic earth movements are the*

displacements of crustal rocks that operates vertically along the earth's radius /at right angle to the earth.

(mark as a whole=2marks)

(b) Give any three features formed in extensional boundary of tectonic planes. (3 marks)

- ✓ Rift valleys
- ✓ Escarpments / fault scarps
- ✓ New oceanic crust/Basins
- ✓ Volcanic islands
- ✓ Oceanic ridges

(any 3x1=3mks)

(c) Describe how the following causes earth movements

(i) **Convectional currents (4 marks)**

- ✓ *Molten rocks circulate in cyclical manner in the mantle.*
- ✓ *Convectional currents move from inside the mantle towards the mantle's surface and then horizontally and finally vertically*
- ✓ *As they move horizontally, beneath the SIMA / oceanic crust, they exert a frictional drag on the crustal rocks causing them to move horizontally*

(ii) Gravitative pressure (4 marks)

- ✓ *When large quantities of magma escape from the upper mantle to the surface, large cavities / voids are left behind*
- ✓ *the force of gravity acts on the coastal rocks above the cavities*
- ✓ *This exerts pressure on the rocks which eventually move inwards to fill up the void below*
- ✓ *This movement causes both horizontal and vertical movements on the earth's crust*

Alternative/OR

- ✓ *During a volcanic activity, magma escapes to the surface of the earth*
- ✓ *The volcanic materials / lava accumulates on the surface*
- ✓ *Voids / cavities / openings are left in the chambers*
- ✓ *Gravitational forces pull back the accumulated material / lava to fill the voids below*
- ✓ *As material fall back, and then push the crustal rock causing vertical / horizontal movement of rocks.*

(d) State *four* characteristics of the Gregory Rift Valley. (4 marks)

- ✓ *the height / altitude of the rift valley vary*

- ✓ *has numerous extensive and fairly level surfaces*
- ✓ *has depressions / some occupied by lakes*
- ✓ *Has an average width of about 60 – 75 km*
- ✓ *Is bound by escarpments*
- ✓ *Has some fault guided drainage*
- ✓ *Has a series of minor faults*

(e) Explain *four* effects of faulting on the physical environment. (8 marks)

- ✓ *faulting leads to formation of depressions on the crust*
- ✓ *Leads to formation of escarpments/ steep slopes on the earth's surface.*
- ✓ *Leads to formation of block mountains / fault blocks*
- ✓ *Leads to the breaking/fracturing of rocks/ facilitate denudation*
- ✓ *Leads to the formation of water falls*
- ✓ *Leads to reversed drainage*
- ✓ *Tear faulting followed by horizontal displacement of rocks may lead to shifting of a river channel*
- ✓ *Faulting along a river channel may lead to fault – guided drainage*
- ✓ *Faulting causes faults that may cause disappear of rivers underground*
- ✓ *Faulting may lead to the occurrence of earth quakes*
- ✓ *Faulting may be followed by volcanicity and the formation of volcanic features*

8. (a) Differentiate between derived and cultivated vegetation. (2 marks)

- ✓ *<u>Derived vegetation</u> is a plant cover that grows in an area after the natural vegetation is interfered with by man while <u>Planted/Cultivated Vegetation</u> is a plant cover which has been planted by man.*

(b) Explain how the following factors influence vegetation distribution in Kenya:

(i) Living organisms (2 marks)

- ✓ *Bacteria, earth warms and burrowing animals improve soil fertility resulting into more vegetation growth.*
- ✓ *Insects and birds pollinate plants enhancing their propagation.*
- ✓ *Bacteria and insects cause plant diseases resulting in death of some e.g. aphids which affected cypress in late 80s.*
- ✓ *Large herds of wild animals can destroy vegetation through overgrazing and lead to loss of natural vegetation leading to growth of derived vegetation.*
- ✓ *Afforestation have led to the establishment of planted forest.*

(ii) Precipitation (2 marks)

- ✓ *There is a large number of plant species in areas with high precipitation and these areas are dominated by forests with broad leaved trees to help increase the rate of transpiration.*
- ✓ *Areas with moderate rainfall are dominated by grasslands.*
- ✓ *Areas with low rainfall have scanty vegetation with thin leaves or fleshy stems.*

(c) The map below shows the global distribution of vegetation. Study and use it to answer the questions that follow.

(i) Identify the vegetation labelled W, X and Y. (3 marks)

Y – *Equatorial/ tropical rain forest.*
X – *Desert vegetation.*
W – *Coniferous forest.*

(ii) Describe the adaptive characteristics of the vegetation labeled E on the map. (6 marks)

- ✓ *The grass dries up in the dry season as a preservation measure against drought and quickly sprouts at the onset of the rains.*
- ✓ *Most trees are thorny to protect them from browsing animals.*
- ✓ *Most trees have long roots to tap underground water.*
- ✓ *Most trees have thin waxy leaves to reduce loss of water through transpiration.*
- ✓ *Most trees are umbrella shaped to provide shade on the ground and thus reduce the rate of evaporation at the root area.*
- ✓ *Some trees such as baobab have thick-fleshy stems to store water.*
- ✓ *Some trees shed their leaves during the dry season to reduce loss of water through transpiration.*

(d) Your class is to planning to undertake a field study on vegetation in Mau forest;

(i) State *three* preparations you would carry out. (3 marks)

- ✓ *Seeking permission from the relevant authorities.*
- ✓ *Setting the objectives /and hypotheses.*
- ✓ *Reading more about the topic of study.*
- ✓ *Holding discussions on the topic of study.*
- ✓ *Carrying out a pre-visit.*
- ✓ *Preparing questions and questionnaires to be used during fieldwork for data collection.*
- ✓ *Deciding on means of travelling to the area of study.*
- ✓ *Obtaining a route map.*
- ✓ *Gathering the relevant materials and tools for the fieldwork.*
- ✓ *Conducting sampling in case the area is too large.*
- ✓ *Dividing the class into groups and appointing the group leaders.*
- ✓ *Preparing a working schedule.*

(ii) Give *three* sampling techniques you would use. (3 marks)

- ✓ *Random sampling.*
- ✓ *Systematic sampling.*
- ✓ *Stratified sampling.*
- ✓ *Cluster sampling.*

(iii) Identify *four* challenges you are likely to face during the actual field study. (4 marks)

- *Presence of thick vegetation cover which may hinder movement within the forest.*
- *Injuries from thorns.*
- *Tiredness/fatigue due to walking long distances.*
- *Uncooperative respondents.*
- *Adverse weather conditions such as heavy rainfall.*
- *Loss of direction in the forest which may lead to wastage of time.*

(Any other topic relevant answer)

9. (a) (i) Differentiate between aridity and desertification (2 marks)

- ✓ *A dry patch of land deficient in water leading to scarcity of vegetation while desertification is a slow but steady encroachment of desert like condition on to potentially productive agricultural land*

(ii) Explain the following processes of wind erosion

- **Abrasion (2 marks)**
  - ✓ *Wind blows over the desert surface carries a lot of materials like sand, gravel etc.*
  - ✓ *The materials grinds, scratch, scrap and polish the rock surfaces in a process called abrasion.*
- **Deflation (2 marks)**
  - ✓ *The process by which wind removes dry unconsolidated material from the earth's surface*
  - ✓ *Fine and light particles are blown away as dust storms*
  - ✓ *The heavier materials are rolled along the ground thus lowering the surface to form hollows*
  - ✓ *The lighter materials which are air-borne polish the surfaces of the rock outcrops.*

(b) With a well labelled diagram, describe the formation of a mushroom block. (5 marks)

- ✓ *A homogeneous rock outcrop lie on the path of the prevailing wind.*
- ✓ *Wind erodes the rock using the materials being transported through abrasion*
- ✓ *More abrasion occurs near the base of the rock where the abrasive material are more leading to a narrow base.*
- ✓ *Eventually a rock block with a narrow base and broad top forms called a mushroom block.*

(Text=4mks
Diagram-1mk
Total=5mks

(c) (i) State *three* factors which influence wind transport (3 marks)

- ✓ *Presence of obstacles*
- ✓ *Strength and speed of wind*
- ✓ *Amount of load*

- ✓ *Vegetation cover*

3 x 1= 3 mks

(ii) Give *three* characteristics of a Barchan (3 marks)

- ✓ *windward slope is gentle*
- ✓ *leeward slope is steep*
- ✓ *Made of massive deposition of sand*
- ✓ *it has hornlike slopes on the leeward side*
- ✓ *It experiences eddy currents on the leeward side*

(d) Form Four students carried out a field study near their school on action of water in arid areas.

(i) Give *three* reasons why they required in a route map (2 marks)

- ✓ *It shows the route to be followed*
- ✓ *Maps help to show the locality of main features*
- ✓ *It enables the researcher to know obstacles likely to be encountered and prepare well to overcome them*
- ✓ *enables a research to prepare a work schedule*
- ✓ *helps the researcher to estimate the distance and prepare a budget*
- ✓ *enables the researcher to estimate time likely to be taken in the field study*
- ✓

(ii) State *three* problems they are likely to encounter while in the field. (3 marks)

- *fatigue due to difficult terrain*
- *attack by wild animals*
- *extreme weather conditions ie rainy*
- *sudden illness*
- *in accessibility of some areas*
- *accidents in the field ie falling down*

(iii) Name two features that likely to observe (2 marks)

- ✓ *wadi*
- ✓ *dry river valley*
- ✓ *bajada*
- ✓ *inselbergs / pediments*
- ✓ *mesa*
- ✓ *buttes*
- ✓ *playa*
- ✓ *canyon/gorges*

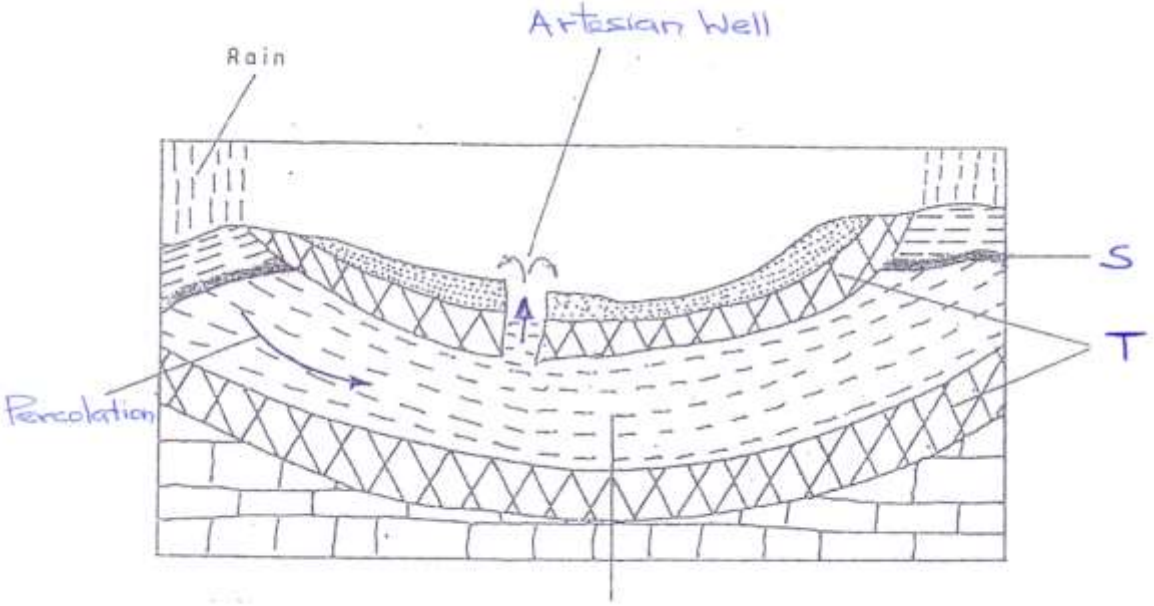
- ✓ *salinas*
- ✓ *alluvial fans*

10. (a) State *three* factors necessary for the development of Karst scenery.
(3 marks)

- ✓ Presence of hard and well jointed rocks to allow permeability.
- ✓ There surface rock should be thick layers of limestone/ dolomite or chalk.
- ✓ The climate should be hot and humid with abundant/ moderate rainfall to facilitate solution.
- ✓ The water table should be deep to allow formation of the features.

(Any 3x1=3mks)

(b) The diagram below shows an Artesian Basin. Use it to answer the question (i) and (ii).



(i) Name the parts marked S and T. (2 marks)

- ✓ *S- Water table*
- ✓ *T- Impermeable rock*

(ii) State *three* necessary conditions for the formation of an artesian well. (3 marks)

- ✓ *The aquifer must be made of the same permeable materials.*
- ✓ *Aquifer must be sandwiched between impermeable rocks.*
- ✓ *Aquifer must outcrop in the region of water intake*
- ✓ *The basin should dip towards a region where land surface is lower than the exposed end/ form a broad syncline/basin.*
- ✓ *The mouth of the well must be lower than the intake area.*

(Any 3x1=3mks)

(iii) Explain how a doline is formed. (4 marks)

- ✓ *Rain water mixes with Carbon IV oxide in the atmosphere to form weak carbonic acid.*
- ✓ *The rain water containing the acid reacts with Calcium carbonate in the limestone rock to form Calcium bi-carbonate which is soluble.*
- ✓ *As the solution percolates into the rock though the joints, the rock is eroded by solution.*
- ✓ *The joints deepen and widen forming small hollows called swallow holes.*
- ✓ *Continued solution widens the hollows so the blocks of rock between the hollows are dissolved completely.*

- ✓ **The swallow holes join/coalesce forming a large rounded / elliptical depression called a doline.*

(6 ticks, steps be clear, *the last point must be there to score max.4mks)

(c) (i) Give reasons why some lakes are fresh. (3 marks)

- ✓ *Some are located in areas of high rainfall which supply fresh water and dilute the salts keeping the lakes fresh.*
- ✓ *Some have surface outlets which drain away excess salts from the lakes.*
- ✓ *Some have subterranean outlets which drain off salts from the lakes.*
- ✓ *Some have regular inflow of fresh water from rivers which dilutes the salts in the lakes.*
- ✓ *Some are located in cool areas/areas of low temperatures hence low evaporation rates.*

(Any 3 x 1 =3mks)

(ii) Describe how a tarn is formed. (5 marks)

- ✓ Snow accumulates in shallow pre-existing hollow/depression on the mountain side.
- ✓ The snow gets compacted into ice
- ✓ Alternating freezing and thawing deepen the hollow.
- ✓ The accumulated ice erodes the hollow by abrasion and plucking making it deep and wide
- ✓ Eventually a deep steep-sided depression called a cirque is formed.
- ✓ Melt water and rain water collect in the depression to form corrie lake/ tarn.

(d) Explain *two* negative effects of lakes. (4 marks)

- ✓ *Excessive rainfall can cause a lake to expand causing its water to spill over flooding of the shores and the surrounding areas.*
- ✓ *The shallow waters of the fresh water lakes provide conducive environment for breeding of pests that causes diseases.*
- ✓ *Lakes can be an obstacle to land transport like roads and railways increasing the distance to be followed.*
- ✓ *Man-made lakes may lead to displacement of people and division of communities.*
- ✓ *Some lakes are habitats for wild animals like hippos which are dangerous to human life and destroy crops.*
- ✓ *Some lakes have saline water that is unsuitable for irrigation, domestic and industrial use.*

(Any 2 explained points x 2=4marks)