



10.0 GEOGRAPHY (312)

The KCSE Geography examination tests candidates' ability to comprehend, apply and analyze geographical concepts that are spelt out in the secondary school syllabus. The year 2006 Geography examination adequately sampled all the areas of the syllabus that students were expected to have covered from form one to form four. The questions tested a wide range of skills as spelt out in the specific objectives of the syllabus.

The Geography examination is usually in two papers. *Paper 1 (312/1)* tests *Physical geography* and *Map work* while *paper 2 (312/2)* tests *Human and Economic geography*. In the year 2006, each of the two papers had a total of ten questions unlike in the previous years when there were nine questions per paper. In both papers, candidates were expected to answer all the short answer questions in section A and three out of the five essay type questions in section B. Compared to the previous years, candidates had a wider choice in section B.

10.1 GENERAL CANDIDATES' PERFORMANCE

The table below shows the performance of candidates in Geography for the period 2003 to 2006.

Table 13: Candidates' Performance in Geography for the Period 2003 to 2006

Year	Paper	Candidature	Maximum Mark	Mean Score	Standard Deviation
2003	1		100	32.83	16.22
	2		100	42.81	16.34
	Overall	92,551	200	75.64	30.92
2004	1		100	41.21	17.18
	2		100	41.34	15.91
	Overall	97,817	200	82.51	31.00
2005	1		100	36.68	16.31
	2		100	45.90	15.83
	Overall	106,865	200	82.56	30.00
2006	1		100	46.12	19.23
	2		100	37.34	15.74
	Overall	97,991	200	83.44	33.00

The following observations can be made from the table above:

- (i) The candidature dropped from **106,865** in the year 2005 to **97,991** in the year 2006.
- (ii) There was a significant improvement in the candidates' performance in paper 1 (312/1) whose mean rose from **36.68** in the year 2005 to **46.12** in the year 2006.
- (iii) The overall performance in the last three years has had minimal variation with the lowest mean at **82.51** in the year 2004 and the highest at **83.44** in the year 2006.

This report analyzes candidates' performance in the questions that registered poor performance and attempts to highlight the possible causes of the poor performance in these questions. It also gives advice to teachers on the possible approaches that would assist in improving performance in the subject in future examinations.

10.2 PAPER 1 (312/1)

The questions in which candidates' performance was poor in this paper are discussed here below. These are questions 4 and 5 in section A and 6, 7 (c), 8 and 10 in section B.

10.2.1 Section A

Question 4

- (a) Name two scales used to measure the intensity of an earthquake.
(b) Give three causes of earthquakes.

In this question, candidates were expected to have knowledge of causes of earthquakes and how they are measured.

Weaknesses

Many candidates performed poorly in this question because they mixed up intensity and magnitude of earthquakes in part (a) of the question, while some wrote down the effects of earthquakes instead of the causes in part (b) of the question.

Expected Responses

- (a)
- Rossi Forrel scale.
 - Mercalli scale.
- (b)
- Gravitational pressure.
 - Collision of tectonic plates.
 - Energy release in the mantle.
 - Violent volcanic eruption.
 - Nuclear explosions.
 - Movement of magma within the crust.

Question 5

The table below represents rainfall and temperature figures for a town in Africa. Use it to answer the questions that follow.

Month	J	F	M	A	M	J	J	A	S	O	N	D
Temp. (°C)	27	28	28	28	27	25	25	24	25	26	27	26
Rainfall (mm)	25	38	99	140	277	439	277	69	142	201	71	25

- (a)
- (i) Calculate the annual range of temperature for the town.
(ii) Calculate the total annual rainfall for the town.
- (b) State two characteristics of the climate experienced in the town.

Candidates were expected to interpret the climatic data and draw conclusions based on it.

Weaknesses

Some candidates were not able to calculate the annual range of temperature and the total rainfall. This could possibly be because they did not know the interpretation of the two concepts. This was unfortunate as these concepts are studied as early as primary school level.

Expected Responses

- (a) (i) $28-24 = 4^{\circ}$
(ii) 1803
- (b)
- The town experiences high temperatures throughout the year ($24 - 28^{\circ}\text{C}$).
 - The annual range of temperature is small/ 4°C .
 - Rain falls throughout the year/there is no marked dry season.
 - The rainfall pattern has double maxima.
 - The wettest month is June/the driest months are December and January.
 - Rainfall is high/1803 mm.
 - The hottest months are February to April / the coolest month is August.

Advice to Teachers

It is important that students practise calculating values such as the *mean*, *range* and *total rainfall* from tables. They should be taught how to identify characteristics of climate from climatic data. This kind of knowledge will be easy to master through continuous practice.

10.2.2 Section B

Question 6

Study the map of Nyahururu, 1:50,000 (Sheet 105/4) provided and answer the following questions.

- (a) (i) Give the six figure grid reference of the junction where the road to Ndaragwa (D 388) meets with the road to Nyeri & Nanyuki (B5).
- (ii) Calculate the bearing of point X from point Y.
- (iii) Name **three** physical features found along the line XY.
- (b) (i) Draw a square 12 cm by 12 cm to represent the area enclosed by the Easting 10 and Northing 10 to the North-eastern part of the map.
- (ii) On the square, mark and label
- the main river
 - all weather loose surface road
 - a forest.
- (c) Citing evidence from the map, explain two
- (i) physical factors that may have influenced the location of Nyahururu town..
- (ii) factors that favour saw milling in the area covered by the map.
- (d) Describe the drainage of the area covered by the map.

Candidates were expected to read and interpret the map of Nyahururu. The map reading skills tested were reading grid references, working out bearings and interpreting physical and human features on the map.

Weaknesses

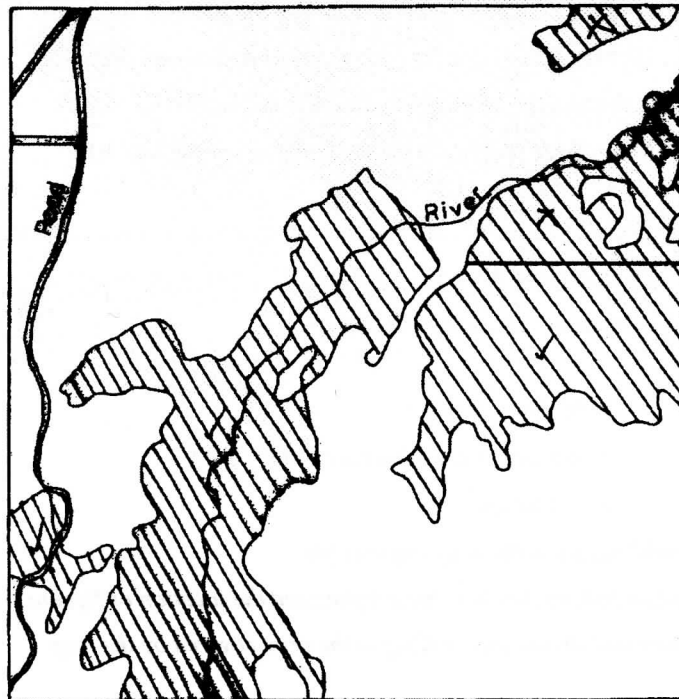
Many candidates were not able to give the correct grid references. Others had no idea how to work out bearing, while there were those who drew sketch sections when they were required to draw sketch maps. Generally, performance in part (c) of the question was poor because candidates failed to distinguish between physical and human features as required.

Performance in map work has been poor over the years. Teachers are either failing to give proper tuition or there is a general negative attitude towards map work among the learners.

Expected Responses

- (a) (i) 114031
(ii) 312° - 314° / 313°
(iii)
- Rivers.
 - Scarp slope/escarpment.
 - Gentle slope.
 - Seasonal swamp.
 - Woodland vegetation.

(b)



KEY



Forest

- (c) (i)
- Availability of water from the nearby rivers for domestic and industrial use.
 - The high altitude (over 2300m), which makes the area experience cool climate/, which makes the area ideal for settlement.
 - The gently sloping terrain/ flat land as shown by the widely spaced contours, which is ideal for settlement and construction of roads.
 - Presence of Thompson's falls which is a tourist attraction encourages settlement.
 - Availability of building stones from the nearby quarries.
- (ii)
- Presence of extensive forests to provide raw materials.
 - Availability of transport by road and railway to transport logs and sawn timber.
 - Presence of large population as shown by the many settlements to provide ready market for the products.
- (d)
- The area has many rivers/high density of rivers.
 - The water courses are generally permanent.
 - The rivers form dendritic pattern.
 - There is a watershed along the Gitunda & Ol Ngarua road.
 - There are many dams/reservoirs along the water courses.
 - Some of the rivers end in swamps.
 - There are seasonal/papyrus swamps.
 - There are rapids/Thompson's falls.
 - Some of the rivers disappear underground especially in the north-west.
 - There are some artificial drains/drifts especially in the south-western and southern parts of the area.
 - The rivers flow from different directions, some to the north, others north-westwards and others north eastwards.
 - There is a pond at grid reference 020130.
 - There is a parallel drainage pattern along the escarpment.
 - There are some short disappearing rivers.
 - There are some short rivers at the escarpment.

Advice to Teachers

Teachers should instruct students to use simple techniques of calculating bearing as illustrated in the text books. They should also practise how to draw sketches from maps. Students also need clear guidance on how to interpret physical and human aspects from a topographical map. Map interpretation is about being able to identify / describe and make conclusions based on all the geographical aspects shown on a map.

Question 7 (c)

Explain three causes of river rejuvenation.

Question 7 as a whole required that candidates have studied and mastered the development of river valleys, erosion and deposition and the resultant features. In part (c) of the question, candidates were expected to have knowledge on the causes of the incision of a river channel.

Weaknesses

Candidates failed to display knowledge of the concept of rejuvenation. Many gave responses that were not relevant while a large number of candidates who attempted question 7 failed to answer part (c).

Expected Responses

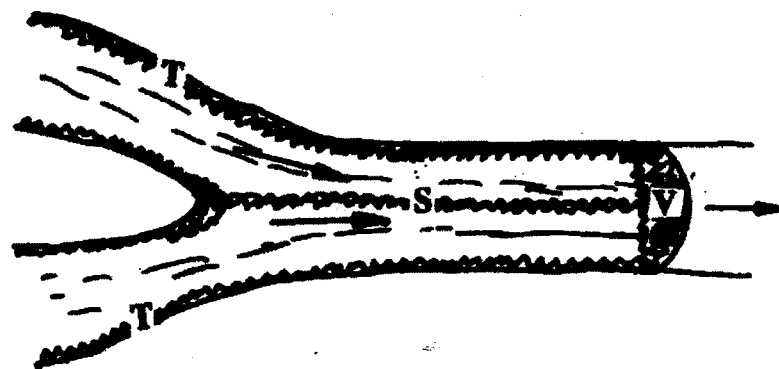
- A fall in sea level which increases the velocity of the river thereby increasing the erosive power of the river.
- Regional uplift which increases the gradient along the river course thus making the river to renew the erosive power.
- Vertical erosion by the river may expose resistant rocks which creates a knick point thus causing the river to renew erosive power.
- Presence of a lake along the river course leads to deposition of alluvium in the lake. As the river flows out of the lake its erosive power increases. Increase in river discharge due to increase in precipitation or river capture may cause a river to renew its erosive power.
- Unequal regional subsidence of land along the river course increases the gradient and therefore the erosive power of the river.

Advice to Teachers

Teachers should ensure that there is thorough teaching so that students can understand the characteristics of features formed by internal and external land forming processes.

Question 8

- (a) (i) *What is an ice sheet?*
- (ii) *Give two reasons why there are no ice sheets in Kenya.*
- (iii) *Explain three factors that influence the movement of ice from the place where it has accumulated.*
- (b) *Describe how an arête is formed.*
- (c) *The diagram below shows types of moraines in a valley glacier.*



- (i) *Name the types of moraines marked S, T and V.*
- (ii) *Explain four positive effects of glaciation in lowland areas.*

Candidates were expected to have studied the topic on glaciation and mastered aspects such as formation of ice, movement of ice, types of moraines and effects of glaciation.

Weaknesses

This was one of the unpopular questions among candidates and the general performance was lower than in other questions possibly because to many students, the topic is abstract. In part (a), (iii) of the question some candidates named the factors but could not explain them. Scores in part (b) of the question were poor because many candidates were not aware of how an arête is formed. In part (c) (ii) of the question, candidates mixed the effects of glaciation in highlands and in lowlands.

Expected Responses

(a) (i) It is a continuous mass of ice covering a large area / surface.

(ii)

- Kenya experiences high temperatures under which ice cannot form.
- Most parts of Kenya have low altitudes.
- Kenya is found on low latitudes.

(iii)

- **Gradient of the land:** ice moves faster when the slope is steep.
- **Temperature:** Higher temperature results in thawing leading to faster movement of ice.
- **Nature of the surface:** when the surface on which ice is moving is rough it causes friction lowering the speed of the movement of ice.
- **Size/thickness of the glacier:** large masses of ice exerts pressure, which leads to melting of ice underneath. This increases the speed of ice movement.

(b)

- Two adjacent hollows exist on a mountain side.
- The two hollows are filled with ice.
- The ice erodes the sides through plucking and deepens the hollow through abrasion.
- Through erosion, the back walls of the hollows slowly recede.
- Eventually the hollows/cirques are separated by a knife-edged ridge called an arête.

(c) (i)

S	-	Medial
T	-	Lateral
V	-	Terminal

(ii)

- Glacial till provides fertile soils for arable farming.
- Ice sheets in their scouring effect reduce the land surface and depth to expose mineral seams which become easy to extract.
- Outwash plains comprise of sand and gravel which are used as materials for building and construction.
- Lakes formed through glaciation can be exploited for various economic uses such as fishing, transportation or as a tourist attraction.
- Glaciated features are tourist attractions.
- Glaciated lowlands are generally flat due to erosion and deposition and are ideal for construction of buildings and communication lines.

Advice to Teachers

Students should be made to understand all the favourable factors for the existence of glaciers and ice sheets. They should be able to explain the factors that influence the movement of ice. This is one topic where diagrams, and where possible, models should be thoroughly used to enable students grasp the concepts on glacial features. This is necessary because the features do not exist in areas where students can easily visit.

Question 10

- (a) (i) What is soil catena?
(ii) Draw a labelled diagram to show a well developed soil profile.
(iii) State **three** characteristics of the soils found in the arid regions of Kenya.
- (b) Give **three** factors that determine the colour of soil.
- (c) Describe how laterization occurs.
- (d) Explain how the following farming practices cause soil erosion?
(i) Burning.
(ii) Continuous application of fertilizer on farm lands.
(iii) Monoculture.

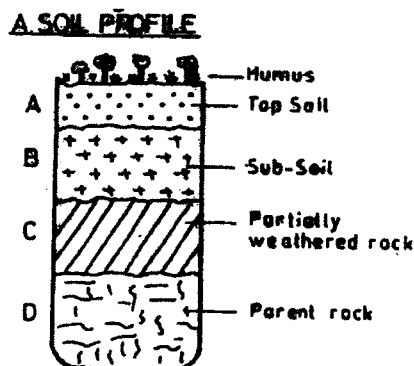
To be able to answer this question satisfactorily, candidates were expected to have studied the topic on soils and mastered areas such as *soil catena*, *profile*, *types of soils* found in different regions in Kenya and the processes of soil degradation.

Weaknesses

This was an unpopular question and most of those who attempted it did not seem to have been well prepared for it. Many lost marks in part (c) of the question, which some candidates avoided all together. Others could not explain how continuous application of fertilizers and the practice of monoculture can cause soil erosion. This could be associated with inadequate coverage of the topic or poor tuition.

Expected Responses

- (a)
(i) Soil catena is the sequence of different soils on a slope.
(ii)



- (iii)
 - The soils are light in colour.
 - They are saline.
 - They are sandy/ stony.
 - They are loose in texture.
 - They are thin.
 - They have low moisture content.

- (b)
 - The type of parent rock.
 - The amount of organic matter/humus.
 - The chemical composition/the degree of concentration of iron oxides/minerals.
 - The amount of water in the soil/the drainage of the soil.

- (c)
 - 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 are deposited further downwards to the lower layers.
 - Insoluble minerals such as iron and aluminium accumulate on the top layers to form a crust of laterites.

- (d) (i)
 - Burning destroys micro-organisms which are essential for formation of humus which binds soil particles together.
 - Burning destroys vegetable matter that protects soil against erosion/vegetable matter forms humus hence less protection.
 - Burning destroys nitrogen fixing bacteria making the soil less fertile and therefore few plants that would protect the soil.
 - Burning loosens the soil making it susceptible to erosion/leaching which drains away soluble mineral nutrients.

- (ii)
 - This increases the acidity of the soil/changes the soil pH.
 - Acidic soils are unsuitable for a variety of crops which would protect the soil from erosion.
 - Acidity destroys the micro-organisms in the soil/fungi/bacteria which could have helped in the formation of humus that binds soil particles together.

- (iii)
 - Monoculture leads to exhaustion of certain minerals from the soil making it infertile and bare leading to its erosion.
 - Monoculture leads to loosening of soil particles thereby encouraging soil erosion.

Advice to Teachers

The topic on soils should be taught with thoroughness, as it is one of the topics that students are likely to find difficult. There should be regular testing in this area to find out the weak areas for remedial teaching.

10.3 PAPER 2 (312/2)

In this paper the questions discussed are 2 and 4 in section A and 8 (c) and 9 (a) (ii) and (b) (ii) in section B.

Question 2

- (a) Give two methods used to reclaim land in Kenya.
(b) Outline the stages through which land is reclaimed from the sea in the Netherlands.

Candidates were expected to have mastered the various methods used to reclaim land in both Kenya and the Netherlands.

Weaknesses

Candidates got part (a) of the question correct. Though candidates knew the processes of land reclamation in the Netherlands, they lost marks because they failed to indicate the stages as a process and instead presented them in a mixed up manner.

Expected Responses

- Part of the low-lying land covered by sea water is enclosed using strong walls / dykes.
- Ring canals are constructed to lead water to pumping stations.
- The water is pumped out using wind mills/ diesel/ electric pumps.
- Ditches are then dug to drain excess water from the enclosed land.
- Chemicals are added to the soil to reduce salinity / fresh water is pumped in the enclosed land to reduce salinity.
- Reeds are planted to suck up water / further reduce salinity.
- Oats, lye and sugar beet are planted to improve the PH of the soil and reduce the water further.
- The land is dry and ready for use.

Advice to Teachers

Reclamation of land in the Netherlands is a process and mere points cannot be used to explain the process effectively. It should be taught as a sequence and if mixed up, then it becomes incorrect.

Question 8 (c)

Explain the measures that could be taken to control the following problems in urban centres in Kenya.

- (i) High rate of crime.
(ii) Water pollution.

In this question, candidates were expected to have knowledge of the functions of the various zones of an urban centre and apply this knowledge to relate the benefits of the CBD to the people who live near a town and how to overcome some of the modern challenges in urban centres.

Weaknesses

The worst part of the question was part (c) where many candidates were not able to come up with possible ways of resolving urban crime and water pollution. Some gave a list of measures without explaining them while others gave irrelevant responses.

Expected Responses

- (i)
 - Encouraging community policing to complement the efforts of the police force.
 - Controlling the influx of illegal arms in order to reduce incidences of thuggery.
 - Enforcing laws without favour to provide protection to the law-abiding citizens.
 - Getting rid of street families to reduce the number of idlers in the towns.
- (ii)
 - Educating residents on the appropriate ways of refuse disposal to avoid polluting water sources.
 - Enacting and enforcing laws on environmental management/ charging those found contravening the laws.

Questions 9 (a) (ii) and (b) (ii)

- (a) (ii) *Explain four ways in which Kenya has benefited from the development of the Seven Forks hydro-electric power scheme.*
- (b) (ii) *Explain four effects that the increase in oil prices has had on the economies of the oil-importing countries of Africa.*

In both parts of the question, candidates were not only expected to know the facts but also be able to explain them. Part (b) (ii) of the question involves current trends in the economies of most African states as affected by oil prices and candidates who keep abreast with what is happening should have found it easy to explain.

Weaknesses

Most candidates failed to give explanations and in both parts of the question. They simply gave a list of facts. In part (b) of the question, many candidates displayed ignorance in what is happening currently as a result of increase in prices of oil.

Expected Responses

- (a) (ii)
 - The dams are used for generating electricity which is used for industrial and domestic purposes.
 - The dams are tourist attractions which generates foreign exchange for the country.
 - The scheme led to the development of industries thus creating employment opportunities.
 - Kenyans have been employed in the scheme thus raising their standard of living.
 - Some of the dams provide water for irrigation thus improving agricultural production.

- The reservoirs provide fishing grounds which supply fish to the local people.
- It led to the development of roads making the area more accessible.
- It led to the reduction of importation of power thus saving foreign exchange.
- The dams provide useful sites for educational purposes.

(b) (ii)

- The countries spend more of their foreign exchange on importing of oil thus leading to a decline in development of other sectors of their economies.
- There has been an increase in the cost of transport causing a rise in the cost of movement of people, goods and services.
- Production costs have increased leading to an increase in prices of commodities thus reducing the demand on these items.
- Some industries that rely on by-products of petroleum have reduced production leading to redundancy/unemployment.
- The countries have experienced low economic growth leading to general poverty among the citizens.
- It has led to the need to establish/look for cheaper sources of energy to replace/supplement oil.
- It has created awareness to conserve energy.
- The countries that have oil potential have started exploring the possibilities of drilling their own oil to reduce/stop importation.

10.4 GENERAL COMMENTS

- 10.4.1 Care must be taken to read questions and focus on the relevant areas as stated in the question. Irrelevant responses though they may be accurate geographical facts, are not awarded marks.
- 10.4.2 Teachers are advised to read supplementary materials to enrich the content they get in the text books. They should also encourage the students to read widely in order to be conversant with emerging issues and current approaches in addressing challenges facing the society.
- 10.4.3 It is advisable to revise the topics covered in the lower forms just before the onset of the final examinations to refresh students' memories.
- 10.4.4 Teachers should endeavour to apply a wide range of teaching methods to enhance effective delivery of the content. For instance, there are topics in the syllabus, which would be easier to understand if conducted practically or through field exercises. A little effort by the teacher can go a long way in improving candidates' performance in examinations.