

## GEOGRAPHY FORM 4 PP1 MARKING SCHEME

1. a) 450E X  
2 pm 8pm 6 hrs  
15 = 1h  
= 6h - 900  
90 + 45 = 1350E
- b) - Gravitational force  
- Centripetal force  
- Centrifugal force (3 x 1)
2. a) - Richter scale  
- Mercalli scale  
- Rossi scale (2 x 1)
- b) (i) Passage of large trucks and trains over areas with weak rocks.  
(ii) Using explosives during mining.  
(iii) Establishment of large reservoirs cause slips on weak rocks.  
(iv) Use of nuclear bomb (Any 2)
3. a) - Mantle  
- Crust (2 x 1)
- b) - Has radius of about 3500 km  
- Made up of two layers – outer and inner.  
- Outer core is about 2300 km thick  
- Temp. is approx. 37000c  
- Main minerals are iron and nickel.  
- Average density is about 17.5g/cc (Any 3 x 1)
4. a) - Rift valley  
- Block mountain/horst block  
- Tilt block  
- Fault step

- Escarpment/fault scarp (Any 2 x 1)
  - Formation of waterfall
  - b) - It may change the direction of flow.
  - Disappearance of a River.
  - May cause a Reverse drainage
  - Formation of depressions which may form lakes. (Any 2 x 1)
5. a) - Weathering is the process of rock disintegration forming soil without movement (insite) while mass wasting is the downward movement of weathered materials by gravity.
- b) - Formation of scars on the land
- Triggers off soil erosion.
  - A landslide can block a river causing it to change direction of flow.
  - Mass of materials from landslides can block a river and form a lake on the up stream.
  - Forms new landforms at the base of a landslide. (Any 2 x 1)
- c) - The nature and weight of the materials.
- Vegetation cover
  - The angle of slope of the land.
6. Study the map of Migwani 1:50,000 (sheet 151/1) provided and answer the following questions.
- (a) (i) What is the altitude of the lowest contour shown on the map? (1 mark)
- 660m
- (ii) Give the six-figure grid reference of Mboni dam. (2 marks)
- 073784
- (iii) What is the length in Kilometres of the All Weather Road Bound Surface C94 from the junction with the Dry Weather Road D502 to Northing 84? (2 marks)

- 5.6 km

- (b) Draw a rectangle measuring 10 cm by 8 cm to represent the area enclosed by Eastings 90 and 00 and Northings 62 and 70. (1 mark)

On the rectangle, mark and name the following features:

- (i) Musengo school
- (ii) Road E742
- (iii) Kitui Hills

(3 marks)

- (c) (i) Citing evidence from the map, identify four social services offered in Mutitu (Ndooa) township. (4 marks)

Services	Evidence
- Health/medical services-	Healthcentre
- Administration services-	Court house/Chief's office
- Water supply services-	Pipeline/water tank
- Education services-	School
- Housing services-	Built up area/huts

- (ii) Describe the relief of the area covered by the map. (6 marks)

-The lowest altitude is 660m/ the highest altitude is 1515m above sea level.

-The land rises from the East to the West.

-To the east of Easting 08, the landscape is generally hilly/has many hills.

-There are many interlocking spurs along river valleys

-There are some broad valleys in the South East.

-The landscape is dissected by river valleys.

- There are many narrow river valleys in the highlands.
- The land is gently sloping in the east.
- There are steep slopes in the hilly areas/ to the West.
- Some areas in the east are flat.
- There are ridges in the central and South Western part.

(d) Describe the characteristics of the long profile of river Ikoo. (6 marks)

- River Ikoo flows to the South East.
- The river has many meanders
- The river becomes wider from grid square 0769.
- There are interlocking spurs along the course of the river.
- The river has many small tributaries that form a dendritic pattern along the course.
- Some parts of the long profile have a steep gradient.
- There are sand/mud deposits downstream
- The river is permanent. (1x6) 6 mks

7. a) i)

- deficiency / insufficient rainfall in an area and high evaporation rate than the precipitation 2mks

ii)

- sandy desert , stony desert , rocky desert / Hamada 3mks

b)

- prolonged drought / low rainfall
- increased temperatures and excessive evaporation
- human activities like deforestation / overstocking
- continentality
- rain shadow effect of high mountains any 2 1mk each 2mks

c) - speed and force of wind . faster wind cause more erosion and greater load it can carry

- nature of load . fine materials are easily picked up and blown than heavier materials
- obstacles – on the path of wind reduces speed and wind deposits some of the materials 3x2=6mks

d) i) Rock pedestal

- a rock outcrop made of alternatively hard and soft rock layers protrudes in a desert horizontally
- abrasion attacks the rock on top wearing away the soft rock layers. The hard layers protrude out horizontally
- it leads to formation of a mushroom shaped rock feature called rock pedestal 3mks

ii) Zeugen

- zeugen is formed in desert where alternating horizontal layers of hard and soft rock occurs
- the top layers of hard rock is jointed / has cracks
- weathering opens up the joints
- wind abrasion erodes the joints deepening and widening them to reach the soft layer of rocks
- deflation blows away the loose broken materials
- furrows are formed and gradually widened as abrasion continues into the soft rock
- the hard resistant rock forms ridges separating the furrows. The process creates a ridge landscape called zeugen.
- last point must be mentioned to earn 3mks

e)

- water from oasis is used for irrigation and domestic purposes
  - desert land forms are ideal for military training / testing weapons
  - loess form fertile soils for agricultural purposes
  - some desert features like rock pedestal zeugens and yadangs are fascinating and attract tourists, earning foreign exchange
  - desert features like badlands hinder transport network
  - hot sun in deserts provide large amounts of solar energy
  - sand dunes migration may destroy rich agricultural farms and interfere human and animal life
- any 6 6mks

8. a) i) Distinguish between soil profile and soil catena

Soil profile refers to the vertical arrangement of soil layers from the surface to the bedrock while soil catena is sequence of different soil types down a slope from the top to the bottom of the hill.??

(2mks)

Mark as a whole

ii) State two importance of minerals in the soils

- Form the soil framework
- Give anchorage to plants
- Determine the porosity of the soil
- Add minerals to the soil

(any 2x1 – 2 mks)

B iii) importance of humus

- supply plants with food and minerals
- source of food for micro-organisms
- yields acids which contribute to weathering
- high water holding capacity hence helps soil to retain water
- helps promote development of a structure for water and air circulation
- adds to soil fertility
- determines the soil PH 3X1 MARKS

bi) Explain how the following factors influence soil formation

a) Climate

- rainfall provides moisture required for chemical weathering leading to soil formation
- rainfall affects the rate at which soil forming process occur
- seasonal variation of rainfall can cause concentration of salts in the soil
- high temperatures increase the rate of weathering thus accelerate soil formation
- also speed up bacterial activities hence help in decay of organic matter adding humus in the soil
- wind water and ice erosion carry away the top soil leading to formation of this soils
- eroded materials are carried and deposited elsewhere leading to formation of loes and alluvial soils

(3x1 – 3mks)

b) Living organism

- Assist in breaking down of rocks through burrowing ploughing and root penetration
- Influence the chemical composition of soils by adding or removing organic acids and minerals
- Burrowing of animals improves soil aeration
- Decay of plant and animal remains add hums and mineral hence influencing soil fertility

(any 3x1 = 3 mks)

c) Describe calcification as a leaching process in soil formation (3 mks)

- Process involving formation of soil rich in carbonate horizon B and C
- Process occurs in areas where evaporation exceeds precipitation and the parent rock is rich in calcium carbonate
- As evaporation takes place, the concentration of salts and bases in the soil solutions increases
- The dissolved substances rise through capillary action then precipitate in horizon B and calcium bicarbonate changes into carbonates forming a crust of calcium compounds within the same profile

d) i) What is soil degeneration?

This is the decline in the usefulness of soil due to soil mismanagement or environmental causes or both

OR

This refers to the loss of soil fertility

(1mk)

ii) Identify two types of soil degeneration

- physical degeneration
- chemical degeneration
- biological degeneration

any 2x1 = 2mks)

e) Explain three ways in which vegetation protects the soil from degeneration

- Leaf cover reduces the force of raindrops which would loosen and dislodge the soil particles reducing splash erosion.
- Vegetation cover increases the infiltration of rainwater into the soil thus keeping the soil moist.
- Plant roots penetrating into the soil help to carry moisture into the soil and allow it to gradually percolate deeply.
- Plant cover breaks the force of wind at the ground level thus reducing loss of soil particles and reduces evaporation which would make soil dry and loose.
- Decayed vegetative matter provides humus which binds soil particles together.

Any 3 explained x 2 = (6mks)

9. (a) (i) A rock is a substance made up of minerals or combination of mineral particles cemented together and forms the solid part of the earth's crust. (2 marks)

(ii) Two reasons why sedimentary rocks are widespread in the coastal plain.

- The coastal areas was once on extensive part of the continental shelf of the Indian ocean sedimentation took place on this shelf extensively.
- The shallow continental shelf also provided a conducive environment for the formation of coral rocks.
- Upon the emergence of the land from the sea, extensive areas with sedimentary rocks and corals were exposed as dry land. (2 marks)

b) (i) Changes that occur to sedimentary rocks when they are subjected to intense heat and pressure.

- New minerals are formed
- Further recrystallization of minerals occur
- Rock particles become compacted
- The physical appearance/colour changes
- The rock becomes metamorphosed. (4 x 1 = 4 marks)

(ii) Processes through which sedimentary rocks changes into metamorphic rocks changes into metamorphic rocks.

- During the process of mountain formation pressure and heat are generated. They both modify the structure of the original rock. This is thermal dynamic metamorphism.
- Weight of overlying rocks exert pressure on the lower changing the rock structure. This is dynamic metamorphism.
- Hot gases, liquids or magma may intrude into rocks during volcanic eruptions. The heat recrystallize the rock grains changing its structure. This is thermal/contact metamorphism (metasomatism).

c) Formation of coral rocks

- They are formed by tiny marine organisms called coral polyps which live in colonies in the sea.
- The polyps extract calcium from the sea water to make their shells.
- When the polyps die, their hard exo-skeletons (the shells) of calcium carbonate accumulate into a solid mass.
- Successive colonies of polyps attach themselves onto the solid mass and out one another.



- The spaces between the dead coral polyps are cemented by calcareous algae.
- The rock grows in size to become coral rocks.

d)(i) Source of secondary information

- Text books/journals/periodicals/magazines/newspapers
- Maps/geological maps.
- Photographs/pictures/videos/films
- Tape recorded information

(ii) Activities in the field study.

- Drawing sketches
- Observations
- Collecting of rock samples
- Making notes
- Taking photographs
- Asking/answering questions
- Studying geological maps.

10. a).(i) A spring is a natural outflow of water from the rocks or underground while a well is a hole sunk into permeable rock to reach the water table. (2 marks)

(ii) Four conditions favouring formation of artesian wells.

- The aquifer must be of semi permeable materials.
- The aquifer must be exposed in an area of sufficient precipitation.
- The aquifer must lie in between two impermeable rocks for it to retain water.
- The basin must dip towards a region where the land surface is lower than it is at the exposed end of the previous formation.
- There must be a partial construction or total blockage of exit sufficient for the water that comes in higher portion of the aquifer to be replaced under pressure. (4 x 1 = 4 marks)

b) (i) A Karst scenery is a limestone region where water action has created unique features. (2 marks)

(ii) Karsts surface features.

- Scarps
- Hills
- Dry valleys
- Gorges
- Gully/grikes
- Clints
- Swallow holes/sink holes
- Dolines
- a. Uraras
- b. Pole
- c. Karsts windows
- d. Karsts bridges (5 x 1 = 5 marks)

c) Formation of limestone pillar

- Limestone pillars are formed when stalagmite join stalactite.
- If a stalagmite forms directly below a stalactite the two features grow towards each other
- They eventually meet forming a continuous column that resembles a pillar. This is a limestone pillar.

Exp – 3 marks

Diag – 3 marks

Total - 6 marks

d)Significance of Karsts scenery to human economic activities.

- Karsts features from good tourist attractions like the caves, gorges, dry valleys who bring in foreign exchange.
- Collapse of doline into water table may lead to lakes in the Karst area. Solution lakes occur in poljes and provides domestic and industrial water.
- Karsts scenery landscape is characterized with intermittent streams or obsence of streams leading to scarcity of water supply in these areas.

- The limestone areas are also characterized by outcrops of bare rock, rugged rock and steep sided dry valleys with gorges which make development of infrastructure especially roads not only difficult but also expensive.
- Lime stone areas are very favourable for grazing purposes, particularly for sheep because the soil is thin and the surface dry.
- Cement used in the building industry is derived from limestone rock e.g. in Kenya cement factories found at Bamburi due to coral limestone presence.

(3 x 2 = 6 marks)      - Saturation of the surface  
(Any 3 x 1)