**FORM THREE GEOGRAPHY**

**312/1 (GEOGRAPHY PAPER 1) MARKING SCHEME**

**SECTION A**

**1. (a) Define the term mineral. (2 marks)**

 ***A mineral is an inorganic and crystalline substance occurring naturally with a definite chemical composition at / beneath the surface of the earth.***

**(b) Give three examples of metamorphic rocks. (3 marks)**

* ***Marble***
* ***Quartzite***
* ***Slate***
* ***Schist***
* ***Graphite***
* ***Soapstone***
* ***Gneiss***
* ***Hornblende***

**2. (a) Differentiate between rotation and revolution of the earth. (2 marks)**

***Rotation refers to the spinning of the earth on its axis whereas revolution refers to the movement of the earth round the sun on its orbit.***

**(b) State three reasons why the interior of the earth is very hot. (3 marks**

* + ***The original heat at formation is still being retained.***
	+ ***Intense pressure from the weight of overlying materials which generates a lot of heat.***
	+ ***Due to the breakdown of radioactive elements releasing heat in the interior.***

**3. (a) Name two areas in Kenya where heath and moorland vegetation is found. (2 marks)**

* ***Mt. Kenya***
* ***Mt. Elgon***
* ***Aberdare Ranges.***

 **(b) State three characteristics of mangrove forests. (3 marks)**

* ***Trees******have aerial roots which grow from the trunk into the sea.***
* ***The trees are hardwoods***.
* ***Trees are medium in size with branches at low levels***.
* ***The leaves are hard and broad.***
* ***The trees are evergreen.***
* ***The tree barks are thin and smooth***

**4. The diagram below shows a vertical section through the zones of underground water.**

 

 **(a) Name the parts zones marked X, Y and Z (3 marks)**

 ***X – Zone of non-saturation***

 ***Y – Zone of intermittent/seasonal saturation***

 ***Z – Zone of permanent saturation***

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

* ***The aquifer must lie in between two impermeable rocks.***
* ***The aquifer must bend downwards from the intake area to form a broad shallow basin.***
* ***The sides of the aquifer must be exposed in a high rainfall area or a lake.***
* ***The aquifer must be made of the same material to allow water to pass through.***
* ***The mouth of the artesian well must be at a lower level than the intake area.***

**5. Outline four ways through which lakes in Kenya were formed. (4 marks)**

* ***Due to crustal down warping.***
* ***Due to faulting***
* ***Due to vulcanicity.***
* ***Due to erosion.***
* ***Due to deposition.***
* ***Due to human activities such as construction of dams.***

**SECTION B**

**6. Study the map of Yimbo provided and use it to answer questions that follow.**

**(a) (i) Give two methods used to present relief on the map extract. (2 mark)**

* ***Use of contours and form lines***
* ***Use of trigonometrical stations***

**(ii) What is the latitudinal extent of the area covered by the map? (2mark)**

 **From 0000’ to 0015’ South**

**(iii) Determine the six figure grid reference of a waterhole North of Port Southby. (2 marks)**

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**(b) (i) Identify four types of natural vegetation in the area covered by the map. (4 marks)**

* ***Thicket***
* ***Scrub***
* ***Scattered trees***
* ***Woodland***
* ***Papyrus /swamp vegetation***

**(ii) Citing evidence from the map, give two social services offered in the area covered by the map. (4 marks)**

* ***Education due to the presence of schools such as Maranda School and Orengo School.***
* ***Health due to the presence of a dispensary at grid square 1496.***

**(iii) Describe the relief of the area covered by the map. (5 marks)**

* ***The highest point is 1318 metres at grid square 1699 while the lowest point is approximately 1137 metres along the shores of Lake Victoria***
* ***There is a basin on the western parts that is occupied by Lake Victoria.***
* ***Several hills such as Ramogi, Usengi, Serawongo Usire and Abiero occur in the area.***
* ***Steep slopes occur at Ramogi and Usengi hills while most parts to the east are gently sloping.***
* ***There are few and wide river valleys in the eastern parts of the area.***
* ***The land generally slopes from east towards west.***
* ***There is a col at Usengi hill.***
* ***Some parts along river Yala in the Northern region are flat as evidenced by absence of contours.***

 **(c) Draw a square 10 cm by 10 cm to represent the region west of easting 21 and North of Northing 90. On the square, mark and name:**

 **(i) Lake Sare**

 **(ii) A thicket**

 **(iii) Busia District**

 **(iv) All weather road loose surface. (6 marks)**

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**7. (a) (i) Differentiate between weather and weather forecasting. (2 marks)**

 ***Weather is the state of the atmosphere of a given place for a short period of time whereas weather forecasting is the prediction of the state of the atmosphere of a place for the next 24 hours, two days or week.***

**(ii) Give three examples of low clouds. (3 marks)**

* ***Stratus.***
* ***Nimbostratus.***
* ***Stratocumulus.***

**(b) Explain how the following factors affect the temperature of a place:**

**(i) Cloud cover. (3 marks)**

***Dense /thick cloud cover during the day blocks insolation thus lowers the temperature. Absence of clouds ensures maximum insolation thus high day temperature.***

***Thick clouds at night blocks outgoing terrestrial radiation thus warmer nights than usual. Cloudless skies at night ensure maximum terrestrial radiation thus low temperatures/cold nights.***

**(ii) Aspect. (3 marks)**

***Slopes exposes to sunshine are warmer while those that are less exposed are colder.***

***Slopes facing towards the equator in temperate regions are warmer while those facing pole wards are colder.***

**(c) With the aid of a well labelled diagram, describe how convectional rainfall is formed. (8 marks)**

* ***Convectional rainfall mainly occurs in hot lowland regions.***
* ***A large water body such as a lake or sea is heated through insolation causing evaporation to occur.***
* ***Maximum heating of both the land and the water body occurs in the afternoon.***
* ***Heated moist air above the water body rises as cooler drier air descends to replace it forming convection currents.***
* ***As the warm moist air rises, pressure decreases causing it to expand leading to rapid cooling.***
* ***The cooled moist air condenses at higher altitude forming dense cumulonimbus clouds.***
* ***When the clouds are heavy, they release the water in large torrential drops as convectional rainfall mainly in the afternoon.***

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**(d) Suppose you were to carry out a field study at a weather station:**

**(i) State three objectives that you would set for the study. (3 marks)**

* ***To find out the highest monthly rainfall ever recorded at the station.***
* ***To find out the hottest year recoded over the last 20 years***
* ***To find out if the weather station receives satellite data.***
* ***To find out how data recorded at the station is analysed.***
* ***To find out the wettest year recorded at the station.***

**(ii) Give three follow up activities for the field study. (3 marks)**

* ***Writing a report on data collected.***
* ***Drawing of graphs to present numerical data.***
* ***Analysing and classifying the data collected***
* ***Displaying processed photographs taken during the study.***
* ***Conducting group discussions based on data collected.***
* ***Giving a lecture to other students.***

**8. The diagram below represents types of faults and some fault features.**

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**(i) Name the type of faults marked A, B and C. (3 marks)**

***A – Shear fault***

***B – Reversed fault***

***C – Normal fault***

***D – Thrust fault***

**(b) Explain how Isostatic adjustment causes earth movements (3 marks)**

***Processes such as erosion, deposition and melting of large masses of ice may interfere with the balance existing between the sial and the sima.(Isostacy)***

***Massive erosion or melting of ice on the continental crust makes it thinner/lighter while thick deposits on the oceanic crust adds a lot of weight leading to sinking inwards.***

***As the oceanic crust sinks, the lighter continental crust uplifts to maintain the former balance.***

***Sinking of the oceanic crust and uplifting of the continental crust results in vertical earth movements***

**(c) (i) Apart from rift valleys and fault blocks, list three other features formed due to faulting. (3 marks)**

* **Fault steps**
* **Escarpments**
* **Tilt blocks**

**(ii) Using well labelled diagrams, describe how a rift valley is formed due to compression forces. (8 marks)**

* ***Layers of rocks are subjected to compression forces.***
* ***A strain occurs on the rocks leading to the formation of two adjacent and parallel reversed faults.***
* ***Continued compression pushes the two blocks on either side of the faults (side blocks) to a higher level.***
* ***The centre blocks is left at its position.***
* ***The protruding sides are worn out through denudation processes such as weathering, erosion and mass wasting forming escarpments.***
* ***The centre block at a lower level surrounded by steep escarpments is called a rift valley.***



**(d) Explain four ways in which features resulting from faulting influences human activities. (8 marks)**

* ***Block Mountains and horsts formed through faulting are water catchment areas thus sources of rivers which provide water for agriculture domestic/ industrial use.***
* ***Uneven sinking during the formation of a Rift Valley forms depressions that are filled with water to form of lakes that are important fishing grounds.***
* ***Subsidence of land during formation of Rift valleys has led to exposure of minerals that are mined to generate income.***
* ***Windward slopes of fault blocks influence formation of relief rainfall which favour agricultural activities/ forestry/ settlement.***
* ***Faulting has resulted to formation of deep faults which are passage of steam jets that are harnessed to generate electricity.***
* ***Faulting results in the formation of Rift Valleys, escarpments and fault blocks that form attractive sites for tourism activity thus generating income.***
* ***Fault features such as fault blocks and escarpments create difficulties in the construction of roads, railways and pipelines thus increasing the cost of construction.***

**9. (a) Define the term desertification. (2 marks)**

 ***Desertification is the process through which marginal lands are degraded due to climate change and human activities***

**(b) Explain three ways in which wind transports its load (6 marks)**

***Saltation process occurs where coarse grained sand particles are transported through a series of shorts jumps / bouncing along the earth surface.***

***Suspension process is where very fine materials are picked by which raised high and blown for long distances.***

***Surface creep occurs where heavy materials are rolled /pushed for short distances along the earth surface over short distances.***

**(c) With the aid of a well labeled diagram, describe how yardangs are formed. (7 marks)**

* ***Initially, there existed a band of outcrop rock with alternating hard and soft rocks which did lie vertical to each other on a desert surface.***
* ***The vertical rock layers did lie parallel to direction of the prevailing wind***
* ***Soft rocks were eroded directly by wind through abrasion.***
* ***Deflation process removed the worn out materials.***
* ***With time, large furrows developed on the soft rock layers.***
* ***The hard layers of rocks formed ridges standing in between the furrows.***
* ***The ridges of hard rocks are called/formed yardangs***

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 **(d) A group of form four students went out for a field study on action of water in an arid area.**

 **(i) Name three erosional features that they are likely to have observed. (3 marks)**

* ***Wadi***
* ***Mesas***
* ***Buttes***
* ***Pediment***
* ***Pediplain***
* ***Inselbergs***

 **(ii) State three problems they have encountered during the field study. (3 marks)**

* ***Attack by snakes/insect bites***
* ***High temperatures/Hot weather***
* ***Poor visibility due to dust.***
* ***Difficulty in movement due to gulleys/sand***
* ***Shortage of water/thirst.***

 **(iii) What activities would they recommend to the residents in the area as an effort to control desertification? (4 marks)**

* ***Erecting barriers to stabilize the spread of sand dunes.***
* ***Controlled grazing through ranching and paddocking.***
* ***Matching the number of herds with the land carrying capacity.***
* ***Planting of trees to protect the soil.***
* ***Introducing drought resistant crops for food.***
* ***Irrigating dry lands to grow food crops and trees.***

**8. (a) List three types of glacier. (3 marks)**

* ***Cirque glacier.***
* ***Valley glacier.***
* ***Piedmont glacier***

**(b) Explain how glacier erodes through the following processes.**

 **(i) Plucking (3 marks)**

* + - ***Pressure from the overlying mass of ice cause freeze – thaw action***
		- ***Melting water fills the cracks/ joints in the bed rock***
		- ***As the water freezes, it increases in volume, exerting pressure on the cracks, thus enlarging them***
		- ***The enlarged cracks lead to disintegration of the rock***
		- ***The disintegrated rock eventually gets embedded within the ice***
		- ***As the ice moves, it pulls / gorges out the embedded rock from the parent rock***

 **(ii) Abrasion (3 marks)**

* + - ***As the ice moves, it collects rocks and bounders on the way***
		- ***The stones and boulders are frozen into the moving ice***
		- ***Such load is dragged over the underlying rocks polishing / scrubbing/ scratching the surface***
		- ***The boulders and angular debris wear away the rocks on the surface smoothening it***
		- ***This process is called abrasion.***

**(c) The diagram below shows some features formed due to glacial deposition in lowlands.**



 **(i) Name the parts marked P, Q, R and S. (4 marks)**

* ***P-Terminal moraine.***
* ***Q-Erratic.***
* ***R-Outwash plain.***
* ***S-Kettle lakes***

 **(ii) Describe how a glacial trough is formed. (6 marks)**

* ***Initially, there existed a river valley in a mountainous region.***
* ***The river valley had well developed interlocking spurs.***
* ***The entire river valley was covered with ice during the period of glaciation.***
* ***The river valley was eroded through plucking and abrasion.***
* ***The former interlocking spurs were trimmed through plucking and abrasion forming truncated spurs.***
* ***Plucking process straightened and widened the river valley while abrasion greatly deepened it.***
* ***The eroded materials were deposited in lowlands.***
* ***When ice melted, a wide, flat bottomed valley with steep sides called a glacial trough was formed.***

**(d) Explain three negative effects of glaciated landscapes. (6 marks)**

* ***Some boulder clay deposits create a marshy landscape due to poor drainage which hinders agriculture.***
* ***Moraine deposits result in the formations of numerous lakes which reduce arable land e.g within the Canadian shields.***
* ***Infertile sands may be deposited within some outwash plains which make the land unsuitable for agriculture.***
* ***Glaciation results in a rugged landscape which causes difficulties in settlement and construction of transport lines such as roads and railways.***