

**MARANDA HIGH SCHOOL**

***Kenya Certificate Of Secondary Education***

 **THE 2024 MOCK EXAMINATION**

**312/1 Geography Paper 1**

**June, 2024**

**MARKING SCHEME**

1. **(a) Give two kinds of rock metamorphism.**
* Thermal/contact
* Dynamic/kinetic
* Thermo-dynamic/regional 2×1= 2 marks

**(b) State three characteristics of metamorphic rocks.**

* Rocks are harder than the original rocks
* Minerals in the rock re-crystallise
* Formed from pre-existing rocks
* Rocks contain compounds of minerals of great value 3×1= 3 marks
1. **(a) Define the term precipitation.**
* This is any product of the condensation of atmospheric water vapour that falls on the earth’s surface under gravity 1×2= 2 marks

**(b) State three conditions that are necessary for the formation of fog.**

* Cold nights during colder months in areas experiencing winter
* The winds must be light/calm to hold water droplets in suspension
* Clear sky/absence of clouds to permit free terrestrial radiation
* A low-level temperature inversion
* There must be sufficient moisture in the atmosphere
* Sufficient supply of condensation nuclei 3×1= 3 marks
1. **The diagram below shows some features of vulcanicity. Use it to answer the questions that follow.**

 

**(a) Identify the features marked A and B.**

* A – lopolith
* B – sill 2×1= 2 marks

**(b) Name three examples of the feature marked C found in the Kenyan rift valley.**

* Suswa
* Longonot
* Menengai
* Margaret 3×1= 3 marks
1. **(a) Give two processes of wind erosion in deserts.**
* Abrasion
* Deflation 2×1= 2 marks

**(b) State three physical factors which contribute to the development of deserts.**

* High temperatures causing excessive evaporation
* Occurrence of rain shadow effect
* Prolonged period of drought/very low rain
* Existence of cold ocean currents offshore which flow across the path of onshore winds
* Remoteness of land in the interior of the continent far from direct influence of sea/ocean

 3×1= 3 marks

1. **(a) Name two types of soil according to texture.**
* Loamy
* Clay
* Sandy
* Silty
* Gravel 2×1= 2 marks

**(b) State three ways in which soil erosion can be controlled.**

* Afforestation and reafforestation programs
* Proper ploughing techniques
* Mulching
* Control of bush fires
* Regulation of livestock numbers 3×1= 3 marks

**SECTION B**

1. **Study the map of Meru (1:50,000) provided and answer the following questions.**
2. **(i) Give the latitudinal extent of the area covered by the map.**
* 0000’ to 0015’N 1×2= 2 marks

**(ii) What is the approximate height of Ol Doinyo Sabu hill in feet?**

* 5600 feet 1×2= 2 marks

**(iii) Identify three physical features found in grid square 4120.**

* Hill
* River
* Valley
* Steep slope 3×1= 3 marks
1. **(i) Calculate the area of Meru Forest to the east of easting 50.**
* 5 + $\frac{40}{2}$ = 25±0.5 Km2  1×2= 2 marks

**(ii) What is the length in kilometres of the road E807 in the southern part.**

* 7.2±0.1 km 1×2= 2 marks

**(iii) A part from forest, give three other types of natural vegetation in Meru area.**

* Woodland
* Scattered trees
* Scrub
* Riverine trees
* Bamboo 3×1= 3 marks
1. **Describe the drainage of the area covered by the map.**
* There are many rivers in the area covered by the map
* The rivers are permanent
* The main river is Kathita
* R. Kathita flow from the western to eastern part of the area covered by the map
* Most rivers form parallel drainage pattern/dendritic
* There is a seasonal river in Mt. Kenya Forest
* There are seasonal swamps
* Most rivers originate from the south western part
* There is Sacred Lake within Mt. Kenya Forest 5×1= 5 marks
1. **Citing evidence from the map, identify three social services offered in Meru municipality.**
* Health care – hospital
* Administration – Meru DC/DO
* Religion – Church
* Education – schools/Kithoka polytechnic/MTTC/Kenya Methodist University
* Rehabilitation/correction – prison
* Recreation – stadium
* Residential – National Housing/Houses/Buildings
* Security – police station 3×2= 6 marks
1. **(a) What is faulting?**
* This is the fracturing/breaking/cracking of crustal rocks due to tectonic forces. 1×2= 2 marks

**(b) The diagram below shows some faults and associated features.**



 **(i) Identify the faults marked J, K and L.**

* J – reverse fault
* K – normal fault
* L – thrust fault 3×1= 3 marks

 **(ii) Name the feature labeled M.**

* Rift valley 1×1= 1 mark

 **(iii) Describe how a horst is formed by tensional forces.**

* Crustal rocks are subjected to tensional forces
* Lines of weakness known as normal faults are formed
* The side blocks are pulled away by tensional forces
* The two side blocks experience downthrow
* The central block is left rising high as the horst 4×1= 4 marks

**(c) (i) Name three major faulted areas of the world.**

* The Great Rift valley
* The Rhine rift valley
* The Guadalquivir valley of Spain
* San Andreas fault 3×1= 3 marks

 **(ii) State four ways in which faulting influence drainage.**

* Uplift of the landscape/ back tilting may cause rivers to reverse their direction of flow.
* Vertical faulting across a river may cause a change in the base level resulting in the formation of a waterfall.
* Faulting can cause a river to flow along its fault lines leading to formation of fault-guided drainage pattern.
* Some rivers may disappear into the ground through a fault forming underground streams.
* Faulting may expose underground water leading to formation of springs.
* Basins/depressions resulting from faulting may be filled with water to form lakes.

 4×1= 4 marks

**(d) Explain four negative effects of faulting on the environment.**

* Faulting may lead to disjointing of the crustal rocks which disrupt transport and communication lines such as roads, railways, pipelines.
* Sometimes when faulting occurs across a river valley, the direction of flow of the river may change or the river may disappear into fault affecting drainage causing shortage of water downstream
* Faulting leads to subsidence of land resulting to destruction of property and loss of life.
* Rain shadow effect on leeward side of block mountains discourage settlement
* Fault scarp causes land slides which may cause loss of life and destruction of property

4×2= 8 marks

1. **(a) Apart from water vapour, name two other substances that are suspended in the atmosphere.**
* Dust particles
* Pollen grains
* Gases
* Smoke 2×1= 2 marks

**(b) (i) Give two factors that are considered when classifying clouds.**

* height
* shape or form
* appearance 2×1= 2 marks

 **(ii) Name two types of clouds that give rise to rainfall in tropical regions.**

* cumulonimbus
* cumulus
* nimbostratus 2×1= 2 marks

**(c) Explain how the following factors influence climate.**

 **(i) Altitude**

* Temperature decreases with increase in altitude. Temperature is higher at low altitude/ lower at higher altitude because the air is heated from below and not directly from the sun.
* Atmospheric pressure decreases with increasing altitude. Atmospheric pressure is higher at low altitude/ lower at high altitude because the weight of atmospheric air at low altitude is more than at high altitude. 2×2= 4 marks

 **(ii) Distance from the sea**

* Areas closer to the sea are wetter than those far from the sea due to maritime influence.
* During summer, areas far from the sea are drier because the moist onshore winds drop most of their moisture thus bringing dry conditions in such areas.
* Areas near the sea experience lower temperature because maritime air brings cool winds/receive high convectional rainfall 2×2= 4 marks

**(d) Explain three effects of climate change on the physical environment.**

* Flooding of land/ coastlands caused by increased temperature leads to melting of glaciers resulting to a rise in sea level/ change in rainfall pattern/ change in seasonal pattern/ change in winds or air masses pattern.
* Drought caused by increased temperatures resulting to high evaporation/ change in rainfall pattern/ change in seasonal pattern.
* Disruption of natural ecosystems/ loss of biodiversity/ abnormal growth of plants caused by change in seasonal pattern/ rainfall pattern/ global warming/ increased ultraviolet radiation.
* Drying up of water reservoirs (thereby reducing their lifespan) may be caused by increased temperature.
* Soil erosion by water due to increase in rainfall/ soil erosion by wind caused by change in wind/ air masses pattern.
* High ocean/ sea waves/ sea storms due to change in wind/ air masses pattern when they blow more frequently and are more destructive (such as cyclones). 3×2= 6 marks

**(e) Members of your class visited a nearby weather station to study recording of weather elements.**

 **(i) State two features of a Stevenson screen you observed during the study.**

* Has louvers on the sides to allow free circulation of air
* The roof is made of double boarding to enhance free flow of air
* Its painted white to reflect as much sunshine and heat as possible
* Has metallic legs to prevent termites from destroying the wood
* Raised to at least 1.2 m above the ground to avoid direct contact with terrestrial radiation

 2×1= 2 marks

 **(ii) Identify three types of data you likely collected during the study.**

* Rainfall data
* Temperature data
* Wind speed and direction
* Humidity data
* Sunshine duration 3×1= 3 marks
1. **(a) What is mechanical weathering?**
* This is the physical breakdown of rocks into smaller particles without any chemical alteration in their composition. 1×2= 2 marks

**(b) (i) A part from living organisms, give two other factors that influence rate of weathering.**

* Climate
* Nature of rocks
* Relief/angle of slope
* Time 2×1= 2 marks

 **(ii) Explain three ways in which plants cause weathering.**

* As plants grow their roots penetrate into rock cracks/joints causing them to widen and eventually disintegrates
* Plants absorb minerals from the rocks and this weakens the rocks causing them to disintegrate
* Organic acids produced during decay of plant remains causes chemical reactions with rock minerals leading to decay
* Widening of cracks and joints by plant roots allow water and air to enter into the rocks hence accelerating weathering
* Mosses and lichens moisten rock surfaces facilitating chemical weathering

 3×2= 6 marks

**(c) Describe how the following processes of mass wasting occur.**

* **Earth flow**
* Soils and other weathered materials get saturated with water
* They break away from the slope and flow/move downhill rapidly
* A shallow scar is left behind at the point of origin
* The materials are deposited downslope where they form bench-like terraces/mounds

4×1= 4 marks

* **Avalanche**
* It is common in temperate areas during winter and spring
* When temperature rises, ice thaws and lubricates the rock surface
* Quantities of accumulated snow/ice break away and slide over hardened snow surfaces downhill 3×1= 3 marks

**(d) Explain four effects of mass wasting on the environment.**

* Landslides may cause rivers to change their cause reducing the water volume downstream
* Mass wasting leads to formation of derelict land which spoils the beauty of the environment
* Mass wasting leads to slope retreat
* Landslides may burry settlements causing loss of lives
* Landslides cause damage to property when materials cover roads/farms/homes
* Movement of materials downslope loosens the top soil increasing erosion
* Mass movement may create sceneries that may become tourist attractions 4×2= 8 marks
1. **(a) The diagram below shows a sectional view of wells sunk into the side of a hill.**

 

 **(i) Identify the features marked A, B and C.**

* A – permanent well
* B – zone of permanent saturation
* C – zone of non-saturation 3×1= 3 marks

 **(ii) Give three factors that influence occurrence of ground water.**

* Slope of land
* Nature of rocks
* Amount and nature of precipitation
* Level of saturation in the ground 3×1= 3 marks

**(b) Explain three factors which influence formation of features in limestone areas.**

* The surface rocks must be thick limestone to allow solution process
* The rocks 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 be far below the surface to allow for the formation of the features

3×2= 6 marks

**(c) Describe how the following limestone features are formed.**

* **Cavern**
* Underground water dissolves rocks along joints and bedding planes through carbonation and solution
* Further reaction enlarges the joints into a series of tunnels and chambers called caves
* Caves are enlarged through solution process to form large caves known as caverns.

 4×1= 4 marks

* **Clints**
* Rain water dissolves CO2 to form weak carbonic acid
* Acidic rain reacts with limestone rocks to form calcium bicarbonate which is soluble
* Water enters the rocks through joints and enlarges them to form deep gullies called grikes
* The gullies are separated by ridges called clints 4×1= 4 marks

**(d) You are supposed to carry out field study on a karst landscape.**

 **(i) State three reasons why you would need a map of the area of study.**

* To show the extent of the area of study
* To identify the route to be followed
* To estimate the distance
* To show the general nature of terrain 3×1= 3 marks

 **(ii) Give two characteristics of karst landscape you’re likely to identify.**

* The surface is rocky
* There is little vegetation cover/bare surface
* Thin soils
* Lack surface water 2×1= 2 marks