ANSWERS – GEOGRAPHY
FORM ONE

INTRODUCTION TO GEOGRAPHY – ANSWERS

1. Collective term for methodologies of fieldwork, maps and map work and photograph interpretation used in study of geography.
2. • Physical geography
   • Human geography
3. • Climate
   • Rocks and minerals
   • Earth and the solar system
   • Soil
4. • External conditions surrounding of an organism.
5. • Provides knowledge that promote conservation of resources
   • Admission in careers that generate income e.g. Geologist.
   • Learn skills in time management useful in personal activities
6. • Transport lines e.g. roads.
   • Settlement structures e.g. houses
   • Drainage features e.g. boreholes, water dams
   • Industries e.g. coffee mills
   • Farms e.g. tea estates
7. Part of physical conditions that provide home in which certain organisms live.
8. • History
   • Biology meteorology
   • Demography
   • Sociology
   • Agriculture
   • Economics
   • Physics
   • Chemistry
   • Geology
   • Medicine

9. • Demography is the study of human population dealing with numerical aspects of population while population geography is branch of human geography dealing with population explaining where and why people live.
   • Economics deals with availability of resources while economic geography is branch of geography that deals with location and distribution of resources.
10. • Geo, graphein

THE EARTH AND THE SOLAR SYSTEM - ANSWERS

1. (a) • Causes day and night/apparent movement of sun from east to west.
   • Causes differences in time at different longitudes.
   • Causes deflection of winds\ ocean currents.
   • Causes rising and falling of sea tides.
   • Causes variation in atmosphere pressure on the earth surface.

   (b) • Earth revolution
   • Causes changes in position of midday sun at different times of the year.
   • Causes varying length of the days and nights in northern and southern hemisphere.
   • Causes changes in seasons; spring, summer, autumn and winter. • Causes lunar eclipse
2. (a) (i) P - Atmosphere
   (ii) Q - Barysphere/centrosphere/core
   (iii) R -Mohorovicic discontinuity/moho dicontinuity

   (b) • Divided into two-upper and lower mantle
   • Mantles' main constituent minerals are ferro-magnesium and silicate.
   • Mantle is about *2*, 900 km thick.
   • Upper mantle has low temperature than lower mantle.
   • Mantle has temperatures of about 1000°C.
   • Mantle is made up heavier rocks than rocks of earth crust.
   • Upper mantle is made up of an elastic solid/semi-molten
   • Inner mantle is made up an elastic solid/semi molten basic rocks/ viscous liquid.
3. (a) The planets marked F and G is

- Mars
- Neptune

4. (a) Solar system refers to the composition of the sun, the planets and other heavenly bodies related to the sun.

   (b) i) Solar eclipse

   (ii) L - Moon

   M- Shadow

5. (a) i) 21st March and 23rd September

   ii) Due to revolution of the earth.

   (b) i) 274.5 days

   ii) Summer season

6. (i) Solar system - Organization made up of the sun with the nine planets orbiting around it and heavenly bodies,

   (ii) Galaxy - Group/cluster of stars in the universe.

   (iii) Star - Hot mass of glowing gases that transmit light to outer bodies.

   (iv) Asteroid - Small planet-like objects orbiting around the sun between the planets of Mars and Jupiter.

7. • Latitude is the distance north or south of equator measured as an angle from the earth's centre while longitude is the distance of the earth's surface measured east or west of prime meridian and expressed as an angle.
   Latitude is imaginary line running from East to West showing how far North or South a place is from Equator.
   • Dateline is line 180° at which a day is lost or gained while international dateline is zigzag line along longitude 180° deviating land surfaces and at which day is lost or gained.
   • Glowing objects that quickly cross the sky before they burn up and disappear while meteorites are those meteors that pass through the atmosphere brightly but do not burn up.

8. • In solar eclipse moon lie between sun and earth while in lunar eclipse earth lie between moon and sun.
   • In solar eclipse shadow of moon is cast on earth while in lunar eclipse shadow of earth is cast on moon.

- Solar eclipse occurs during the day while lunar eclipse occurs during the night.
- Lunar eclipse is caused by earth's revolution while solar eclipse is caused by revolution of moon.

9.
- Presence of water that support life.
- Presence of atmosphere with adequate O_2 and CO_2 levels that support life of animals and plants respectively.
- Enough heat and light due to earth's favourable distance from the sun.
- Proportional gravitational force that allow objects to be upright on the earth's surface.

10. (a)
- Causes deflection of the winds
- Causes time difference between Meridians.
- Causes variation in speed of air masses.
- Causes rising and falling of ocean currents.
- Causes variation in atmospheric pressure.

G.M	East
34°E	41°E
1 p.m.	?
1° =	4 minutes
4 x 4 =	16 minutes

Local time = 1.16 p.m.

11. (a) Periods 21st March and 23rd September when the sun is overhead at midday along the equator.

(b)
- Sun is overhead at mid-day along the tropic of cancer/Capricorn.
- The Arctic Circle experiences 24 hrs of daylight.
- Days are longer than nights.
- Temperatures are high in the region experiencing summer solstice.
- 24 hour sunshine within the circles.

12. 66 ½ ^{0}, 23 ½ ^{0}

13. (a) Silica, aluminium

(b) 2.7 gms/cc

(c) 6 -10 kms

(d) 3.0-3.3 gms/cc

(e) 3470 kms

(f) 5,500 cc

14.
- Chances of another star approaching the sun are minimal.
- High temperature materials drawn from the sun would disperse rather than condense.
- It does not explain where the sun and the star came from.

15. Hydrosphere is part of the earth surface covered by water masses e.g. oceans, seas, rivers and swamps while atmosphere refers to thin layer of gases surrounding the earth and held by earth's gravitational pull.

16. (a)
1. Uranus
2. Venus
3. Earth
4. Venus
5. Jupiter
6. Venus
7. Mercury

17.
- Earth rotates on its own axis to make a complete turn; and its poles rotate of this axis and pulled towards each other (centripetal forces)
- Equator covers a long distance and therefore rotates faster, with more speed causing a flinging force (centrifugal force).

18.
- Low temperatures
- Longer night times than day times at latitudes beyond equator
- The sun is overhead Tropic of Capricorn on 22nd December and its winter Solstice in the Northern Hemisphere.
- On 21st June the sun is directly overhead the Tropic of Cancer and its winter solstice is in the Southern hemisphere.
- Sun is not visible at cycles and there is darkness for 24 hrs.

19.
- Winter solstice occurs on 22nd December and 21st June when the sun is overhead at mid-day along tropic of Capricorn and Cancer respectively. At the Arctic Circle and Antarctic circles the sun is visible for only a few minutes when it appears above the southern/ Northern horizon.
- Summer solstice occurs on 21st June and 22nd December when the sun is overhead in the tropic of Cancer and Capricorn respectively. The sun rises higher in the sky and is visible for 24 hrs at the arctic and Antarctic cycles.

20. (a) It is a shadow that is formed when rays of the sun are blocked from reaching the earth or the moon.

(b)
- Comets
- Asteroids
- Meteorites
- Satellites

21.
- It is an imaginary line running from North to South that shows how far east and West a place is from the Greenwich prime meridian.
- It refers to angular distance east or west of the Greenwich prime meridian.

22.
- It causes aphelion whereby the earth is sometimes in its farthest position from the sun.
- It causes periphelion whereby the sun is sometime at its closest position to the sun.
- It influences the occurrence of spring and neap tides.
- It changes cycle of equinoxes and solstices
- It influences occurrence of seasons

23. 1° - 4 minutes

47° x 4 = 188 minutes

188 minutes = 3 hrs 8 minutes

Buchanan is 3 hrs 8 minutes behind Nairobi.

Time is 6.52 a.m.

24. (a) On crossing this longitude while going to the West, a day is gained and white crossing to the East a day is lost.

(b) $66^{1}/_{2}°$

(c) Photographs taken from the outer space or satellites show the curvature of the earth.
- During eclipse of the moon, the earth casts a spherical-shaped shadow on the moon.
- Circumnavigation of the earth along a straight path will bring one back.
- Earths horizon
- Other planets are curved and earth is one of planets.
- Different rising and setting times in different places.
- An approaching ship.

WEATHER

1. (a) During the day the land heats faster than the sea.
   - The air over the land rises
   - Cooler air from the sea blows towards the land to replace the rising air
   - The cool air from the sea is called sea breeze

   (b) (i) H- Mozambique, J - Benguera

   (ii) Raising temperature Causes rainfall

2 - Troposphere
- Stratosphere
- Mesosphere
- Ionosphere

3. (a)
   - Air must have abundant moisture.
   - A cloudless night to facilitate terrestrial radiation.
   - Air should be calm to remain in contact with the ground in order to be cooled.
   - There should be gentle air currents to hold water droplets in suspension.
   - The air must be cooled below dew point.

   (b) (i) R - cumulus

4. (a) (i) X - 3°C

   Y - 9°C

   (b) (i) 583 mm

   (ii)
   - Sea make water is heated intensely by solar radiation.
   - Heating is intense in the afternoon
   - Warm moisture laden air rises and condenses at higher altitude.
   - Condensed water vapour forms cumulonimbus clouds.
   - Clouds eventually give rain accompanied by thunderstorm.

5. (a) (i) 30.3 - 28.4 =1.9°C

   (ii) 9.0 + 8.0 + 21.0 + 49.0 + 25.0 + 9.0 + 20.0+10.0 + 4.0+10.0+17.0+11.0 =1930 mm

   (b)
   - Altitude - High altitude areas have low temperature and low pressure. Temperature varies with height because air is heated from below.
   - Winds transfer heat from one place to another causing changes in temperature.
   - Latitude influences climate such that areas near equator are warmer.

- Aspect influences climate as south facing slopes in the northern hemisphere are warmer than north facing slopes in the same.
- ITCZ- zone of low pressure which migrates North and South equator affects rainfall.

6. (a)
   - Sunshine
   - Rainfall
   - Wind
   - Cloud cover
   - Air pressure
   - Humidity

7. a)
   - Open area free of shade by trees and buildings.
   - Gentle land free of flooding
   - Area with wide view of surroundings.
   - Away from concrete surfaces.

   b) Reasons why Stevenson screen is;
   - Painted white - can reflect direct heat from the sun.
   - Louvred on sides - To allow free flow of air and regulate temperature.

8. Relative humidity refers to the ratio between water vapour actually present in the air and its capacity to hold water vapour at a given temperature.

9. (a)
   - It's heavy and torrential/falls in large drops.
   - Usually accompanied by lighting and thunderstorms
   - Falls mainly in the late afternoon
   - It's highly localized and lasts for a short while (15-20 mins)

   (b) Radiation fog forms when air in contact with the ground is cooled through terrestrial radiation while advection fog forms when warm moist air is cooled as it passes over cool surface e.g. land/sea.

10. (a)
    - When the temperature rises, the alcohol in the left hand column expands and pushed the mercury column. The mercury in turn pushes the mercury in the right hand column and steel metal index up.
    - The maximum temperature is shown by the end of the index pushed by the mercury.

- When the temperature falls, alcohol in the left hand column contracts and pulls the index along the tube. When the temperature rises, the alcohol expands leaving behind the index. Then the minimum temperature is read.

(b)
- According to the altitude of their bases.
- Their appearance/structure
- Their formation

11. (a)
- It should be in an open place with free flow of air.
- Away from barrier e.g. trees
- Should be on a fairly level ground.
- The site should be free from flooding
- The site should provide a wide view of the surrounding landscape and the sky.

(b)
- Intensity of the sun's radiation in space the average distance from the sun.
- The transparency of the atmosphere
- Position of the earth in its orbit
- The area and nature of the surface on which the rays fall.

12. Climate — It's the average weather condition of a given place over a period or time usually (30-35 years)

Relative humidity — Refers to the ratio between water vapour actually present in the air and its maximum capacity to hold water vapour at a given temperature.

Weather forecasting — it's the prediction of the weather situation for a given place within a given period of time e.g. hour, a day, a week.

Absolute humidity — It is the total amount of water vapour that a given volume of air can -hold.

Weather lore — Refers to a body of traditional facts and beliefs relating to weather e.g. a halo around the moon, croaking of frogs, a rainbow, migration of birds

13.
- The students are able to relate what they have learnt in class to the real environment hence making geography real and interesting.
- It breaks the class monotony.
- It enables learners to develop skills or observation measurement, recording and analyzing data.
- It improves the visual memory through observation.

14. (a)
- Rain gauge
- The rain gauge is kept in an open space in the weather station from above. Its raised to avoid splashes from entering into the gauge.
- The water collected is emptied into the measuring cylinder every 24hrs.
- Take readings on the measuring cylinder.
- This cylinder is graduated in mm and the level the water emptied reaches gives us the reading amount of rainfall for the day.
- Record the readings and interpret.
- A maximum and minimum thermometer
- When the temperature rises, alcohol in the left hand column expands and pushes the mercury column and maximum temperature is read.
- When the temperature rises, alcohol in the left hand column contracts and pulls the index along the tube and the minimum temperature is read from the upper end of the index.
- After recording the reading, the thermometer is reset using a magnet.
- Interpret the readings.

(b) (i) Convectional rainfall

Its formation

- The intense heating from the sun results into warm air rising in form of convectional currents.
- The rising air reaches the high atmosphere and moisture in it condenses. Forms clouds and falls rain.
- It falls in the late afternoon accompanied lighting and thunderstorms.

(c) **Problems**

- Lightening and thunderstorms which are destructive to life and property.
- The torrential/large drops which are harmful to the crops and other vegetation.
- The hailstones also are destructive to the crop leaves.

15. (a)
- Weather forecasting
- Weather forecasting is the prediction of weather conditions

(b) (i) Problems of weather forecasting

- Inaccurate data

- Defective instruments
- Personnel with limited skills
- Vagaries of nature such as earthquakes

(ii)
- Determines times for sea and air travel.
- Determine time when sporting activities take place.
- Determines the fishing activities and habits in the area.
- Help determine suitable clothing for the day.
- Help plan farmers calendar of activities.
- Help plan suitable housing.

16. (a) How clouds influence weather.
- Clouds determine the amount of solar radiation reaching the earth's surface and the amount leaving the earth's surface. This determines temperature conditions.
- Day temperatures are moderated by clouds.
- Areas of thick rain clouds have high rainfall.

(b) (i) Mean temperature $^{-276}/_{12}$ = 23°c

(ii) Annual rainfall 1073 mm

(iii) Annual range of temperature 5°C

(iv) Mean rainfall - 1073 mm

(v) Wettest month - April

NB. MUST SHOW WORKING!

17. (a) Large volume of air with uniform temperature and humidity and flow over considerable distance

(b)
- Equatorial air mass
- Tropical air masses
- Polar air masses
- Arctic and Antarctic air masses

(c) 15° - 20g/cm^2

6g/cm^3 =?

RH = A.H x 100% = 6 x 100= 30%

Max 20

18. (a) A thermometer/ maximum/ minimum/ six thermometer Hygrometer/wet and dry bulb thermometer.

19.
- At night, land looses heat faster than sea.
- Air upon land becomes cooler and heavier than that upon the sea.
- The relatively warmer air upon the sea is lighter and therefore it rises while the cooler heavier air at the land flows towards the sea to replace the warm rising air.

STATISTICAL METHODS

1. (a) (i) 9600-800 = 8,800,000 Barrels

(ii) 21,150,000 Barrels.

(iii) 21,150,000\30 = 705,000 Barrels

2. Graph

(i) 29.3% (29 - 29.5%) 29%

(ii) 4.75%/4.8%/4.9%

(4.75% - 4.9%)

(iii) Describe the trend of the value of coffee exports from years 1999 to 2003.

- The value was generally declining over the five year period.
- The value was highest in 1999.
- The decline between 1999 and 2000 was minimal/gradual.
- The highest drop was between 2000 and 2001
- There was a minimal drop between 2002 and 2003.
- The decline between 2001 and 2002 was minimal/gradual.
- The value was lowest in 2003.

(iv) Explain three factors which may have led to the increased export earnings from horticultural produce in Kenya between years 1999 and 2003.

- Improved technology which leads to advanced crop husbandry/increase the volume of fresh horticultural products.

- Aggressive promotion of trade abroad leading to a wide/ready market in foreign countries.
- Improved ways of packaging have made the produce more competitive/ attractive,
- Improved infrastructure/air/road transport have helped in the quick means of transportation of fresh produce to the market.
- The declining benefits from traditional agricultural exports leading to the expansion of the areas under horticultural crops.
- The government has encouraged the formation of organizations that are assisting horticultural farmers.

(v) Give three advantages of using simple line graphs to represent data.

- Give clear visual impression.
- Easy to construct.
- Easy to interpret.
- Can be used to represent a wide variety of variables.
- Appropriate for comparison.

(b) Reasons why Kenya's agricultural export earning generally are low

- Kenya sells most of her agricultural products in their raw form and they are priced lowly.
- International prices keep fluctuating from year to year.
- Prices of some commodities are externally determined.
- There is competition from other producing countries/from other similar products.
- Some products are inferior in quality.
- There are fixed quarters for some agricultural products.

- Decline in quantities of some agricultural exports.

3. (a) Statistics It refers to the art or science that is concerned with the interpretation of numeric information.

   Statistical data Refers to the information collected and arranged in a systematic manner.

   Statistical methods Refers to the techniques used in collecting, recording, analyzing and presenting data.

   (b) Primary data and Secondary data

   (c) Closed-ended (rigid) - Open-ended

4. (a)
   - The method should be inexpensive.
   - Should be time saving
   - Should give accurate data
   - Most applicable method

   (b)
   - Discreet data refers to the non-continuous data over time given in whole numbers only e.g.
   - Total population in a nation.
   - Monthly rainfall totals.
   - No. Of livestock per district
   - Continuous data can be given in any value including decimals e.g. 1.8km.

5. Sampling refers to the process by which a representative portion of the whole phenomena under study is analyzed and generalized/ generalization is made.

Types of sampling

Systematic sampling Stratified sampling Random sampling

6. (a)
   - Calculation of percentages
   - Measuring of Central tendency (mean, median and mode)
   - Frequency distribution

   (b)
   - Predicting for future trends.
   - Showing changes through time
   - Establishing Geographical relationships
   - For economic planning
   - For explaining geographical phenomena.
   - Useful for making comparisons.

7. (i)
   - Simple iine graph
   - A combined line and bar graph
   - Simple bar graph

   (ii)
   - The simple bar graph
   - Prominent values stick out well
   - Bars are appealing to the eye
   - Easy to draw, read and interpret the data represented

8. (i) A set of pre-questions which are related to the topic of study.

   (ii)
   - Its a source of first hand information
   - The researcher can ask for clarification from the respondent.
   - Similar questions are used for all respondents and comparison can easily be made.
   - When posted, rigid questionnaires reduce fieldwork expenses.

(iii) Interview involves collection of information by asking questions directly and recording the answers given. In this method the researcher established contact with the respondent and agree on time for face to face interview with the respondent. Interviews can also be carried out on telephone with the interviewee.

9. Methods of data recording

Tabulation This is recording of data by arranging facts of figures in form of table or list.

Photographing This is done by use of a camera to record geographical information.

Tape recording This can be done when one is collecting data through an oral interview where one uses tape recording device to record conversation.

Tallying Used when the data is collected through counting. One counts and puts a vertical strike for every item counted, on the fifth count one puts a diagonal crossing the four strokes.

10. Data refers to facts and figures collected from the field.

11. The mean is

$$72 + 60 + 65 + 70 + 65 + 80 + 65 + 70 + 80 + 84 + 63 + 75 + 63 + 71 + 74$$

$$= \frac{1057}{12} = 70.47$$

12. This is got by arranging the data in an ascending order as follows: 60, 63, 63, 65, 65, 65, 70, 70, 71, 72, 74, 75, 80, 80, 8.4. The middle number is the median: 70

FIELD WORK

1. • The information on rainfall can be used by farmers to plan their calendar of activities.
   • The information on humidity can be used in improving storage of produce e.g. Cereals.
   • The findings can be used to plan suitable time for drying farm produce.
2. Advantages of dividing class into groups.
   • The class will be able to study the entire course of the river.
   • Would enable them to obtain information on each stage of the river.
   • Would save on time.
   • Would enable studies to be carried out in an orderly way.
   • Would encourage participation of all members of class/ entourage individual \ roles.
   • Would facilitate more interaction among the group members.
3. Disadvantages of using secondary data.
   • Recorded data could be out of date.
   • Condition under which data was collected may have changed.
   • Obtaining records on the particular river may be difficult.
4. (i)
   • To design appropriate research method.
   • To prepare the working schedule.
   • To be able to identify relevant equipment for data collection.
   • To identify suitable areas for study/ to familiarize with people who will provide information
   • To seek permission from owners of the land.

   (ii) • Interviewing

- Taking photographs/video recording
- Measuring the extent of polluted area
- Administering questionnaires
- Tape recording.

(iii)
- Analyzing data
- Writing report
- Giving relevant advice to the stake holders
- Discussing the findings
- Displaying photography, sketches from the study area.

5. (a)
- To get permission from the relevant authority.
- To be able to formulate objectives/hypothesis
- To be able to prepare a working schedule/decide on appropriate methods of data collection.
- To determine the respondents/resource persons.
- To determine methods of data collection required.
- To access the problem likely to be experienced in the area.

(b)
- Use as fodder.
- Use for providing fruits/roots/vegetables as food.
- Providing wood fuel.
- Controlling soil erosion
- Use of ornaments/beauty, aesthetics.

(c)
- In order to do a detailed study
- To reduce cost of study
- To save time

- The whole forest is too large to cover within a day.
- It would be less boring to study a small area.
- Some parts may inaccessible
- To reduce bias

6.
- Types of field work
- Field excursions
- Field study
- Field research

7.
- Importance of field work ~
- Breaks classrooms monotony.
- Make study of geography real.
- Helps learner to acquire skills.
- Encourages students to appreciate the environment.
- Enables learners to get first hand information from the field.
- Improves visual memory through observation.
- Enhances what has been learnt in class.

8.
- Procedure of carrying out fieldwork
- Identify type of study
- Statement of objectives
- Formulate hypothesis
- Prepare necessary materials and tools.
- Conduct actual field study.

9.
- Soils
- Rocks

- Vegetation
- Landforms
- Drainage

10.
- Fieldwork preparation
- Seek permission from relevant authorities
- Conduct pre-visit
- Hold class discussions
- Determine methods of data collection and recording.
- Prepare objectives and hypothesis
- Dividing into groups.
- Read secondary materials
- Prepare work schedule.

11.
- Importance of carrying samples
- For laboratory analysis
- There is no adequate time to analyze samples in the field
- Lack of adequate skill to analyze the samples hence need to expert opinion.
- For future reference.
- To expose more students to their findings.

12. Suitable objectives
- To know the type of forest.
- To determine the factors which have favoured growth of forest?
- To know the type of trees found in the forest.
- To find out the problems faced by the forest.
- To find out the economic significance of the forest.

13. Types of hypothesis

- Positive hypothesis This is stated in positive form.
- Null hypothesis Stated in negative form.

14.
- Writing reports
- Drawing tables, graphs and charts.
- Drawing maps
- Displaying photographs.
- Displaying photographs.
- Displaying samples.

15. Problems during fieldwork

- Inaccessibility in some areas due to rugged topography.
- Attack by wild animals
- Harsh weather conditions
- Tiredness
- Accidents
- Language barrier

16.
- To help in identifying methods of data collection
- To help in formulating hypotheses/objectives
- To help in assembling equipments
- To help in estimating the cost of the study
- To seek permission for the visit
- To determine appropriate routes
- To identify likely problems '-"^
- To identify location of data.

MAPS AND MAP WORK

1. (a) (i) 14km (1 3.9-14.1 km)

(ii) 134° (133°-135°)

(b)
- Availability of transport evidenced by railway\road to transport sisal.
- Large tracts of land with scanty settlements allow expansion of far due to availability of land.
- The area receives low rainfall as evidenced by presence of scrub which discourages growing of other cash crops.
- Gentle sloping land evidenced by spaced contours ideal for mechanization.
- Supply of labour evidenced by nucleated settlement around Mwatunge.

(c) (i)
- Escarpments/steep slopes have few or no settlements.
- There are no settlements in the forested areas.
- Most settlements are found near\along roads\motorable tracks.
- South East area is sparsely settled.
- There are many settlements around shops.
- There are few settlements along rivers.
- Sisal estate has no settlements.

(ii) Citing evidence from the map, give two economic activities carried out in the area covered by the map other than sisal farming.

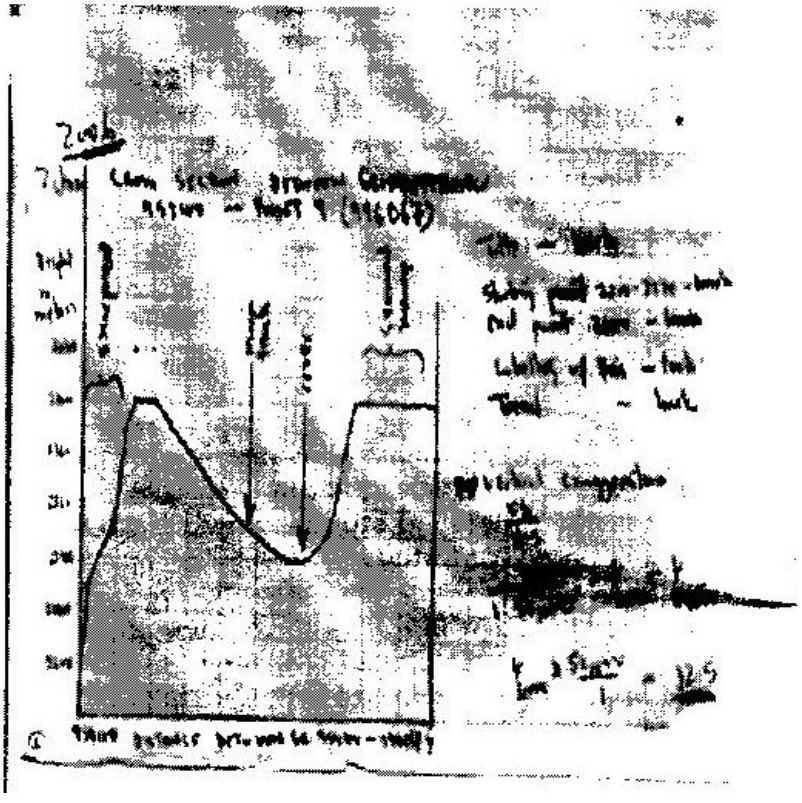
ACTIVITY	EVIDENCE
Cattle keeping	Cattle dips/scrub
Trading	Shops

Transport	Railway\road
Crop growing	Sisal plantation

2. a) Ans; 114031

b) (i) Ans; 317° (316°- 318°)

(ii)



(iii)

c)
- Rivers
- River valleys
- Scarp slope\escarpment\scarp face
- Gentle slope
- Seasonal swamp

- Woodland

d) i) Two types of physical factors that influenced the location of Nyahururu town.

- Availability of water from the nearby rivers for domestic and industrial uses.
- The high altitude (over 2,300m) which makes the area experience cool climate ideal for settlement.
- Gentle sloping terrain ideal for settlement\road construction shown by contours wide apart.
- Presence of Thomson Falls which are a tourists' attraction and encourage settlement by construction of tourist houses.
- Availability of building stones from nearby quarry for construction of houses.

e) Describe drainage of the area covered by the map.

- The area has many rivers\ high density of rivers.
- The water courses are generally permanent.
- Some rivers end in swamps.
- There is a pond 020130.
- Main rivers includes Iguameti, Nyahururu.
- There are rapids at Thompsons falls.
- There is parallel drainage pattern along the escarpment.
- There are papyrus swamps and seasonal swamps.
- Rivers have denclintic drainage pattern.

3. a) 873m

b) Ans- 15 km ± 0.2 KM. (1 5km-1 5.2km)

c) Ans. -0 30"

d) Citing evidence from the map describe the relief of the area shown.

- Land rises from about 600m to about 2,200m above sea level.
- The highest point is Vuria peak at 2208 m \lowest point is about 600m.
- The landscape is generally hilly\numerous hills\mountains\ many ridges eg. Mugange hills ridges\Muraru ridge\ many spurs.
- There is a highland mass in the Mugange Wundanyi area which slopes downwards in all directions. J
- There is river valley of river Voi which has pronounced meanders.
- Some areas are plain e.g. Lower valley Kisushi.
- South-Eastern part is gently sloping.
- Central, Western and Northern side has steep slopes.

e) State differences between a map and a plan.

- The scale of a plan is large while the scale of map may be large or small.
- Plan is drawn to show specific information while map shows general information.
- Plan shows many details of specific feature while map shows few details of many features.

f) Explain two importance of scale in maps.

- Express relationships between objects on map and in real life enabling one to estimate or measure size.
- Control arrangement of symbols avoiding overcrowding.
- Controls space as large scale gives more details than the small scale maps.

4. (a) (i) 139° ± 1° (138 - 140°)

(ii) 7.2 km ± 0.1 (7.1 - 7.3 km)

(b) (i) Relief of the area covered by the map.

- The highest area is Nandi escarpment/187m above sea level.
- The lowest area is to the south West which is about 1140 m above sea level.
- The east is a plain\Kanu plain/plateau
- North western part is hilly with some steep slopes
- To the North Eastern is the Nandi escarpment
- The northern part is dissected by rivers
- The South-west is a basin occupied by a lake.
- There are numerous river valleys with steep sides in the highlands and are broad in the lowlands.

(ii) Influence of relief on settlements.

- The steep slopes/escarpment have been avoided because they are unsuitable for construction of houses/for farming.
- There are a few settlements on the hilly areas because the slopes are gentler.
- The plains are densely settled as the land is flat/gently sloping.
- The basin are avoided as the land is water logged/flooded/swampy.

(c)

Economic activity		Evidence
- Quarrying	-	Quarry
- Trading	-	Markets
- Transportation	-	Roads/railway/main tracks/foot paths
- Processing	-	Sisal factory
- Manufacturing	-	Ginnery/flour mills

(d) (i)

- The river has many meanders
- The river has tributaries/confluences
- The river disappears into a swamp
- The river has a wide flood plain
- The river is at its old age stage (ii) Advantages of studying rivers through field work.
- It enables students to relate what is learnt in classroom to what is in the field.
- Students are able to measure and calculate the velocity of a river and its size.
- Students are able to count the number of tributaries.
- Students are able to gauge the impact of the river on the area.
- They are to find out the uses of the river.
- It allows students to acquire appropriate attitude towards environment.

- It breaks classroom monotony for students and teachers.
- It allows students to use their observation skills to make conclusion.

ROCKS AND MINERALS

1. (a) (i) **Colour** Distinct appearance by colour used to identify specific minerals eg. Gold is yellow.

(ii) **Cleavage** Tendency of mineral to break in certain direction. Some minerals break along planes on which atomic bonds are relatively weak.

(iii) **Hardness** Ability to resist scratching. Various minerals have varying degree of hardness eg. Talc is softest while Diamond is hardest.

(b) (i) **Hyperbbyssal rocks**

- Volcanic rocks\extrusive igneous rock.
- Plutonic rocks/intrusive igneous rocks.

(ii)

- The water should be salty
- Water should be clear free from silt.
- Sea water should be warm with temperatures between 20°C to 29°C
- Shallow water with depth not exceeding 60m.
- Polyps must be in submerged condition.
- Water should be well oxygenated.

(c) • Some unique rocks e.g. crying stone of Kakamega present

spectacular scenery for tourist attraction which helps earn the country some foreign exchange.

- Rocks are parent material for soil formation exploited in agricultural activities.
- Valuable rocks and minerals such as gemstones and diamond are exploited to generate income.
- Rocks provide building and construction materials e.g. marble, ballast and sand used in construction of houses.
- Rocks are useful as raw materials in construction industry e.g. The coral rocks and coral limestone are used in manufacture of cement.

(d)
- A folk jembe- excavating rocks for closer examination.
- A polythene bag -for carrying rocks samples for subsequent studies.

2. (a)
- The rocks are formed from sediments of preexisting rocks.
- Rock sediments are arranged in layers.
- Processes involved act at ordinary temperatures
- Sediments are non-crystalline
- Some sediments contain fossils
- Sediments are compressed, hardened and consolidated by cementing material to form sedimentary rock.

(b) Give two examples of chemically formed sedimentary rocks.

Trona, gypsum, flint, rock salt

3. (a) In each case name the type of rock which results from the metamorphism of:

(i) Granite

(ii) Clay

Granite → Gness

Clay → slate

4. (a) (i) Rocks are naturally occurring agglomerations of mineral particles forming part of the earth crust.

(ii)

(a). Mechanically formed sedimentary rocks formed from deposition of sediments of other rocks in layers.

(b). Organically formed - formed from remains of dead plants and animals which are laid down to layers.

(c). Chemically formed - formed from mineral particles dissolved from tend and deposited in layers into water bodies.

(b)
- Weight of averlying layers cause change in grain arrangement in dynamic metamorphism.
- Heat of magma get into contact with sedimentary rocks causing grains to crystallize or form new minerals.
- During mountain building rocks are compressed and heat generated in thermodynamic metamorphism causing changes in structure and recrystallization of minerals.

(c) i) Granite, diorite and peridotite

ii) Dolerite, porphyrite and diabase.

iii) Basalt, obsidian and pumice.

(d) i) Secondary sources

- Text books/pamphlets/journals/ periodicals/ magazines/ news papers/handouts.
- Photographs/pictures/video tapes/slides/films

- Maps/geological maps
- Tape recorded information

ii) Activities during the field study

- Drawing of sketches
- Observation
- Collecting rock samples
- Making notes
- Taking photographs
- Asking/answering question.
- Studying geological maps -
- Labelling samples
- Breaking rocks
- Digging to access rocks
- Filling in the table.
- Filling in questionnaires
- Tape recording

iii) Likely problems

- Inability to identify the rocks
- Inability to access the rocks
- Accidents/slipping
- Difficulties in climbing/descending steep rocks
- Hindrance by poor weather conditions/rainy/sunny
- Attack by wild animals.

5. (a) i) Plutonic rocks are igneous rocks which form beneath earth surface

when magma cool slowly forming large crystals\course grained/course textured.

ii) Volcanic rocks are igneous rocks formed on the earth surface when lava cool rapidly forming small crystals fine grained/textured.

6. (a) Conditions influencing characteristics of igneous rocks

- Mineral composition
- Mode of formation

(b) Characteristic of sedimentary rocks

- Arranged in layers/strata
- Non- crystalline
- Have bedding planes
- Contain fossils

(c) Limestone, chalk, coral reefs, ironstone, diatomite, coal.

(d)

Original rock	Metamorphic rocks
Limestone	Marble
Sandstone	Slate
Coal	Graphite
Clay/shale	Stale/schist
Mudstone	Slate
Augite	Hornblend
Granite	Gneiss

(e)

- Some rocks forms uniqueness features which attracts tourists and helps to earn foreign exchange.

Rocks are parent material for soil exploited for agriculture.

- Valuable rocks and minerals are exploited to generate income.
- Provides building and construction materials e.g. sand.
- Source of raw materials for cement industry.

7. (a) Mechanically formed sedimentary rocks.

   (i) Arenaceous - Sandstone and grit

   (ii) Argillaceous - Shale, claystone, siltstone, loess, mudstone

   (iii) Rudaceous - Congolomerate, breccia and boulder clay.

   (b) Contact metamorphism is due to heat from magma which leads to changes in appearance and character while regional metamorphism is due to heat and pressure which creates changes in rock structure and minerals.

8. (a) Basalt obsidian, Pumice, tuff, ryorite, andesite.

   (b) Intrusive igneous rocks are rocks formed when magma cools and solidifies below the earth's surface while extrusive are formed on the surface of the earth when lava has solidified.

   Extrusive rocks - Basalt, obsidian

   Intrusive - Granite, gubbro, diorite, perdotite, dolerite, porphyrite, diabase.

9. A rock is an aggregate of mineral particles forming part of the earth's crust,

10. A mineral occurring inorganic substances with definite chemical composition and physical properties.

11. Heat and pressure - causes re crystallization of minerals. This creates new minerals. It also alters the structure of the minerals particles.

12. Calcareous rocks are formed from shells and skeletons of marine creatures. The shells skeletons accumulate in layers and are compressed to form hard correct mass.

13. Carbonaceous rocks are formed from remains of plants which are buried by overlying materials compacting them into hard mass.

14. Coral rocks results from accumulation of skeletons of coral polyps. The skeletons accumulates in layers to form hard compact mass (coral rocks).

15. • By being subjected to
    • Pressure - dynamic metamorphism
    • Heat - contact/thermal metamorphism
    • Pressure and heat - thermal -dynamic metamorphism.

MINING

1. Conditions that are necessary for the formation of petroleum.
    • Presence/deposition of remains of flora and fauna fossils over a long period of time.
    • Presence of non porous rocks underneath the deposits of flora and fauna
    • Deposition of other layers of rocks/ non -porous rocks over the remains of flora and fauna.
    • Compression of remain of flora and fauna due to folding of the layer of rocks.

2. (a) (i) Minerals mined in area marked

W - Fluorspar

X - Gold

Y - Diamonds

Z - Copper

(ii) • Alluvial mining
• Underground mining

- Open-cast mining

(iii) Sea ports through which some minerals mined in East Africa are expected through. -Mombasa, Dar-es-Saalam.

(b) Factors that influence exploitation of minerals.

- Modes of occurrence
- Economic value of the mineral/quality of the minerals/cost of mining.
- Size of the mineral
- Level of technology
- Availability of capital
- Labour supply
- Availability of transport facilities
- Government policy/political influence
- Availability of market

(c) Significance of soda-ash mining

- Creation of employment opportunities.
- Development of infrastructure.
- Development of related industries.
- Improvement of social facilities.
- Earns Kenya foreign exchange.

(d)
- Planted trees
- Creating a park to attract tourists
- Introducing aqua culture
- Landscaping for settlement /farming
- Refilling

3. (a)
- Gas
- Oil\petroleum
- Water

(b)
- Wax
- Bitumen\pitch\asphalt
- Grease lubricants
- Resin\petrol-chemicals

4. Use the map of Africa below to answer the questions below.

(a) Name the minerals mined in the areas marked S, T and V.

S - Oil/Petroleum

T - Bauxite/Gold

V - Diamond

(b) State two formations in which mineral ores occur.

- Some minerals occur as evaporates.
- Others occur as veins/lodes.
- Some minerals occur as alluvial deposits.
- Some occur as weathered products.
- Some minerals are found in seam

(c) Explain four problems which Zambia experiences in the exportation of copper.

- Zambia is landlocked/ has no coastline hence copper has to pass through other countries to reach the seaport.
- The distance from Zambia to the coast is long which makes transportation of copper expensive.

- Political instability in the neighbouring countries makes it insecure to transport copper through them to the coast
- Congestion at the seaports causes delays in loading and off-loading of copper
- Loss of copper through theft while on transit deprives Zambia of the part of the expected revenue.
- Copper is bulky thus it can only be transported by rail which is slow.

(d)
- Describe three negative effects of open cast mining on the environment
- The land is left with gaping quarries which are ugly interfere with the natural beauty of the landscape.
- The heaps of rock waste hinder any other forms of land use/create a landscape that is expensive to rehabilitate/barren landscape.
- The dust produced during the mining pollutes the atmosphere/is a health hazard.
- Open cast mining causes shortage of land as it hinders settlement/leads to displacement/hinders agriculture.
- Large scale blasting of rocks leads to instability of the basement rocks.
- Water collects in the hollows left by open cast mines creating ponds which become habitats for disease causing organisms
- It interferes with the natural vegetation which is cleared before extraction of the mineral begins/takes time to regenerate.

5. (a)
- A vertical shaft is dug to reach the mineral Tunnels are then dug horizontally.
- The roof of the tunnel must be supported to prevent it from collapsing.
- The mineral is then removed by blasting using explosives.

- Its then brought to the surface using a lift.
- The mineral is then transported to the factory for processing.

(b)
- It is an expensive method
- Accidents due to collapsing of mines.

6. (a)
- Ugliness of the land.
- The open pits are health hazards once filled with water.
- The land losses productivity.
- Accidents are likely to occur especially children falling into pits.

7.
- It involves digging out sand from river beats and swirling it around with water in a shallow pan.
- This pan is tilted such that lighter sand is washed over leaving the mineral behind.

8.
- Water shortage for power supply and processing
- Labour shortage
- Increased depth of mines
- Increased cost of mining
- Decreasing availability of ore

9. (a)
- It earns the country foreign exchange
- It generate jobs to Kenyans
- Leads to uplifting of living standards
- Development of settlements e.g. Magadi town.
- Development of transport system

(b)
- Causes scenery ugliness
- Pollution of dust, noise and overburden
- Dereliction of land

- Loss of land productivity which can lead to desertification.

10. (a)
- It involves mixing the alluvial deposits with water in a container.

  The mixture is rotated until light particles (sand, mud) are washed off
- Leaving minerals particles such as gold behind. This is called panning,

(b) Three mining methods
- Open-cast mining
- Underground mining
- Alluvial mining

11.
- Occurrence It forms when rain water seeps down through volcanic rocks which contain soda ash. The water is heated by underground hot rocks. This forces the water to move upwards into Lake Magadi.

  Exploitation Its extracted using the dredger which floats on the lake. Pumps the mixture of trona and water to the factory on the shores through a pipeline. At the factory impurities are removed. This is heated and turned to soda ash ready for packaging and export.

12.
- Earns foreign exchange
- Generates employment opportunities
- Development of settlements
- Lead to development of industry
- Earning higher income hence better living standards.
- Land dereliction
- Pollution
- Loss of biodiversity
- Soil degradation

- Enhancing mass wasting

13. **Gold** is found in quartz or redistributed sediments. Gold is extracted using the deep shaft method. Gold ore is crushed, dissolved and then precipitated to obtain the gold. Gold is used in making of jewellery and ornaments, in chemical industries, in density and for medals. Gold earns export revenue, has led to infrastructure development and provide employment. Rising costs of production, high labour costs and low quality gold are some of problems facing gold mining.

Diamonds are associated with volcanic activities. They occur in igneous rocks in pipes. The ore is blasted crushed and washed. It is then passed through filtering screen and then through a special solution. Diamonds are used in the jewellery industry, for polishing, for drilling, and for cutting instruments. Diamonds; earn foreign exchange, have led to development of towns, have created employment and contributed to development of infrastructure. The problems facing diamond mining to include exhaustion, unstable world market prices, high costs of processing and inadequate labour.

14.
- Uses of soda ash
- Glass manufacture
- Paper making
- In oil refinery
- In textile industry
- In soap manufacture