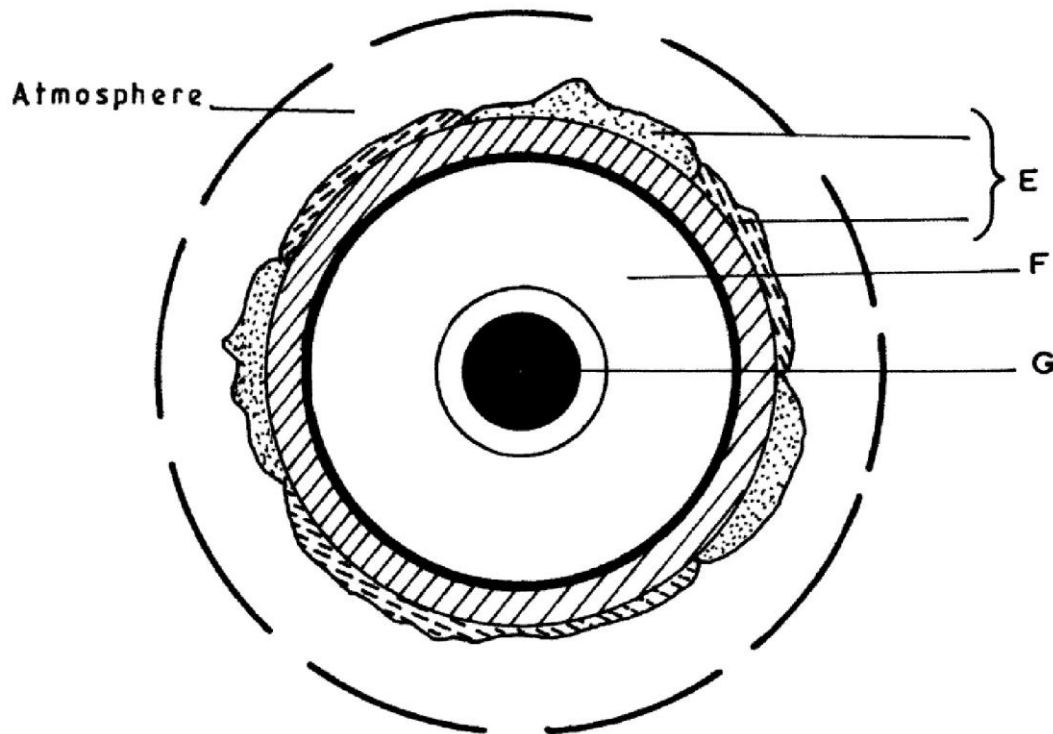


4.10 GEOGRAPHY (312)

4.10.1 Geography Paper 1 (312/1)

SECTION A

1. The diagram below represents the structure of the earth. Use it to answer question (a).



- (a) The layer marked:

- (i) E - Lithosphere/crust/sima/sial/hydrosphere/scal (1 mark)
 (ii) F - Mantle/Asthenosphere (1 mark)
 (iii) The minerals that make up the layer marked G. (2 marks)
 - Iron and Nickle

- (b) Give two effects of the rotation of the earth on its axis.

- The daily rise and fall of tides.
- The occurrence of day and night.
- A difference of 1 hour between two longitudes 15° apart.
- The deflection of winds/ocean currents.

any 2 x 1

(2 marks)

2. (a) What is a metamorphic rock?

This is a rock formed when the original/igneous sedimentary rock is subjected to chemically active fluids/pressure/intense heat which changes its form/structure/composition.

(2 marks)

(b) Give three examples of metamorphic rocks.

- Schist/homblende/mica;
- Slate;
- Marble;
- Quartzite;
- Gneiss;
- Graphite.
- Serpentine (from peridotite)

Any 3 x 1

(3 marks)

3. (a) Name two types of boundaries according to the Plate Tectonic theory.

- Constructive/extension/divergent boundary.
- Destructive/compressional/ convergent boundary.
- Transform fault/conservative boundary.

Any 2 x 1

(2 marks)

(b) Give three effects of the movement of tectonic plates.

- Causes folding/related features of folding.
- Occurrence of vulcanicity/features related to vulcanicity.
- Subduction/oceanic trench.
- Occurrence of earthquakes.
- Causes faulting/features related to faulting causes continental drift.

Any 3 x 1

(3 marks)

4. (a) What is an earthquake?

It is sudden earth movement that causes vibrations within the earth's crust.

(2 marks)

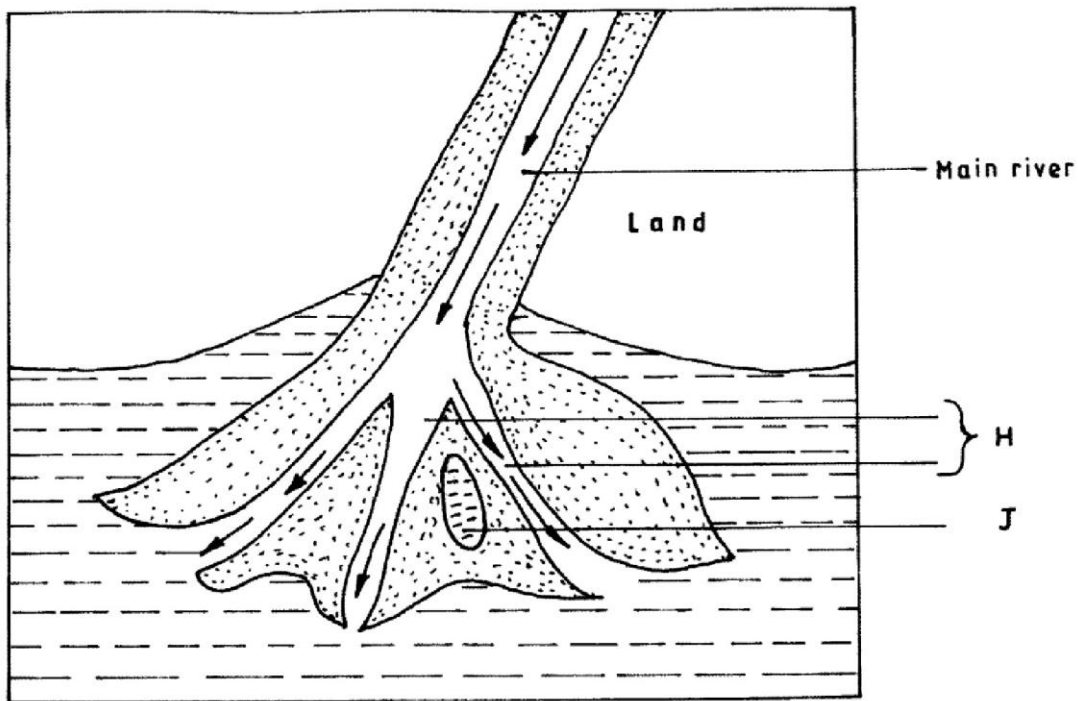
(b) Identify the scales used to measure:

- | | | | | |
|------|------------------------------|---|--------------------|----------|
| (i) | The intensity of earthquakes | - | Mercalli scale. | (1 mark) |
| (ii) | The magnitude of earthquakes | - | The Richter scale. | (1 mark) |

5. (a) Give three characteristics of a river in its middle stage.\

- the river flow is moderate.
- Lateral erosion is dominant.
- The river begins to meander.
- The river has a gentle gradient.
- The river deposits material in the convex banks.
- The river has several tributaries.
- The volume of water is high.
- The main features are river bluff/slip off slopes/open V shaped valley.
- Flood plains begin to form.

The diagram below shows a Bird's Foot delta.



(b) Identify the features marked H and J.

- H distributaries (1 mark)
- J Lagoon (1 mark)

SECTION B

Answer question 6 and any other **TWO** questions from this section.

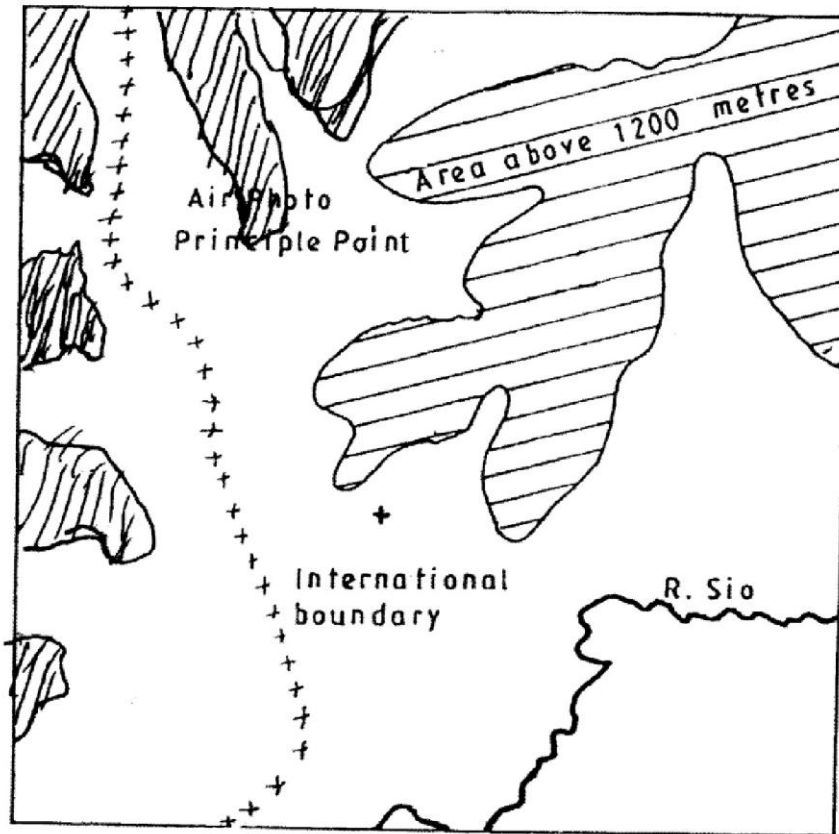
6. Study the map of Busia 1:50,000 (sheet 101/1) provided and answer the following questions.

- (a) (i) Convert the ratio scale of the map extract into a statement scale. (2 marks)
 1 cm on the map represents $\frac{1}{2}$ km / 0.5 km on the ground. (2 marks)
- (ii) What is the general direction of flow of river Sio? (1 mark)
 North East to South West. (2 marks)
- (iii) Identify the two dominant types of natural vegetation shown in the area covered by the map. (2 marks)
- Scrub;
 - Papyrus swamp/vegetation;
 - Scattered trees;
 - Thicket;
 - Three swamp vegetation;
 - Riverine trees;
 - Woodlands
- Any 2 x 1 (2 marks)

(b) Draw a square 10 cm by 10 cm to represent the area west of Easting 30 and north of Northing 40. On the square mark and label:

- | | | |
|-------|---------------------------------------|----------|
| (i) | An International boundary. | (1 mark) |
| (ii) | An air Phot Principal Point. | (1 mark) |
| (iii) | River Sio. | (1 mark) |
| (iv) | The area above 1200 metres sea level. | (1 mark) |
| (v) | Correct drawing. | (1 mark) |

Diagram



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

- The northern part of the area covered by the map is low lying, broad, flood plain.
- The land lies between 1160 metres and 1568 metres above sea level.
- The area towards the south western part is hilly/has numerous conical hills.
- The south western area has an elongated ridge.
- The area towards the east/west/North is gently sloping.
- There are several river valleys.
- There are steep slopes in the south western part of this area covered by the map.
- There are several passes/saddles/cors

Any 5 x 1

(5 marks)

- (d) (i) Explain how the following factors have influenced the distribution of settlements in the area covered by the map.

Drainage

- Areas that are well-drained have many/nucleated settlements.
- Areas that are poorly drained/swampy have few/no settlements.
- There are no settlements near most rivers because they may be prone to flooding.

Any 1 x 2

(2 marks)

Transport

- Along the roads/motorable tracks there are linear settlements.
- At road junctions, there are nucleated settlements.

Any 1 x 2

(2 marks)

- (ii) Citing evidence from the map, state three functions of Funyula town.

(6 marks)

Function

Evidence

- | | |
|-------------------------------------|---|
| - it is a residential centre | huts/built up areas |
| - it is an administrative centre | Chief's camp/chief's house, Police post |
| - it is a transport centre | All weather/loose surface road/motorable tracks |
| - it is a recreation centre | Rest house |
| - it is a commercial/trading centre | Market |

Any 3 x 2

(6 marks)

7. (a) (i) Define the term weather.

(2 marks)

Weather is the daily atmospheric conditions of a place at particular time.

- (ii) Explain how the following factors influence weather.

- **Cloud cover:**
- Thick cloud cover reduces the amount of solar radiation reaching the earth surface thus decreasing the atmospheric temperature.
- Absence of cloud cover leads to an increase in diurnal range of temperature.
- Thick cloud cover blocks terrestrial radiation from leaving the earth surface lower atmosphere thereby increasing the atmospheric temperature.
- The type of cloud determines type/amount of rainfall.
- The amount of cloud cover determines the intensity of sunshine received on the earth surface.
- Shape/height/movement of clouds determines the type of weather that is likely to occur.

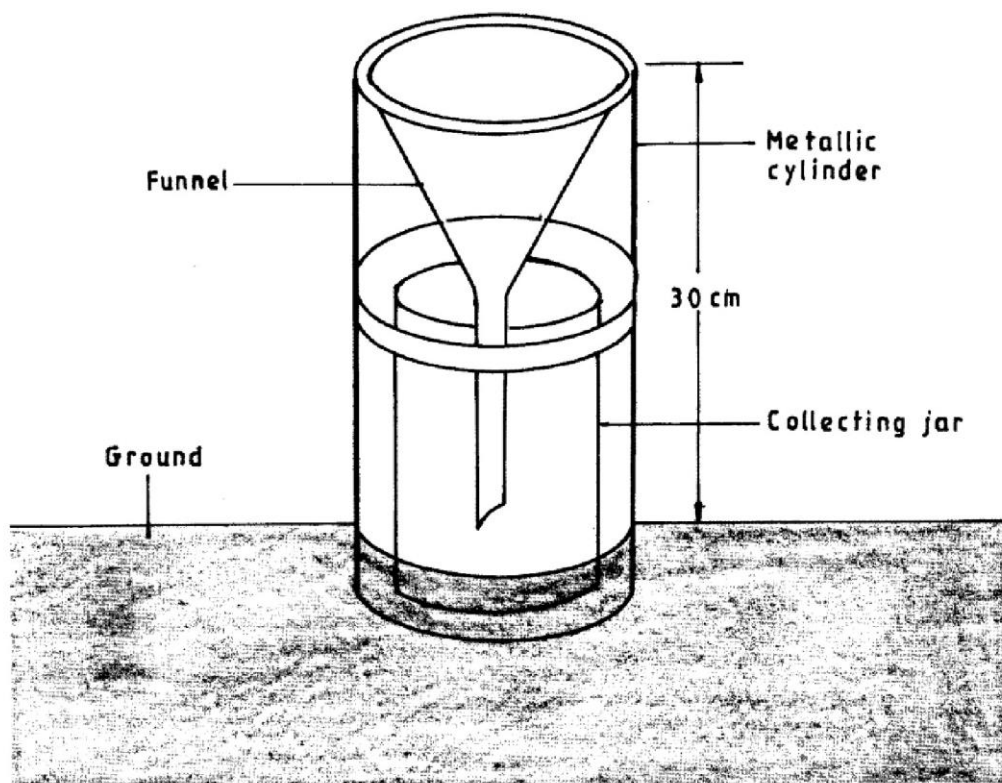
Any 2 x 2

(4 marks)

- **Local winds:**

- Warm winds blowing over an area bring the warming effect thereby raising the temperature of the place.
 - Cold winds blowing over an area bring the cooling effect hence lowering the temperature of the place.
 - Moist winds passing over a region drop moisture as precipitation/increase humidity.
 - Dry winds passing over a region bring a drying effect/aridity/lower humidity.
- Any 2 x 2 (4 marks)

The diagram below represents a weather measuring instrument. Use it to answer question (b).



- (b) (i) Which element of weather is measured using the instrument shown?
- Rainfall. (1 mark)
- (ii) Describe how the above instrument is used.
- The instrument is placed in an open area and rain water collects in the jar.
 - The metal collecting jar is removed from the metal holder.
 - The water is poured into a measuring/graduated cylinder.
 - The reading is taken/recorded.
 - The water is emptied and the instrument is placed outside to collect more water for measuring the following day.
- Any 3 x 1 (3 marks)

The table below shows the temperature and rainfall readings for station T in one week. Use it to answer question (c).

Day	Mon	Tue	Wed	Thur	Fri	Sat	Sun
Temp°	23	23	24	21	25	25	23
Rainfall in mm	50	49	55	45	60	60	49

(c) (i) Calculate:

- The range of temperature for the week.

$$25^{\circ} \text{C} - 21^{\circ} \text{C} = 4^{\circ} \text{C} \quad (1 \text{ mark})$$

- The Mean weekly rainfall. (2 marks)

$$\frac{50 + 49 + 55 + 45 + 60 + 60 + 49}{7}$$

$$\frac{368}{7} = 52.57 \text{ mm}$$

$$\approx 52.6 \text{ mm} \quad (2 \text{ marks})$$

(ii) State four characteristics of the weather in station T.

- The lowest temperature of the station is 21°C .
- The highest temperature of the station is 25°C .
- The Mean weekly temperature of the station is 23.4°C ./moderate
- The highest amount of rainfall for the station is 60 mm/Friday/Saturday.
- The lowest amount of rainfall for the station is 45 mm/Thursday.
- There is rainfall throughout the week.
- There is low weekly temperature range / 4°C .
- It is hot and wet throughout the week.
- There is high rainfall /368 mm.

Any 4 x 1 (4 marks)

(d) Give four characteristics of the stratosphere.

- It extends from 15 - 50 km (equator) and (8 - 50 km) at the poles.
- The lower part of it has constant temperature/is othermal layer.
- It has little/no water vapour.
- Temperature increase with increase in height at the upper layer/negative lapse rate/temperature inversion.
- Temperature ranges from 80°C - 0°C
- It is mainly composed of O-zone gas.

8. (a) (i) Apart from the Rift Valley, name three other relief features formed as a result of faulting.

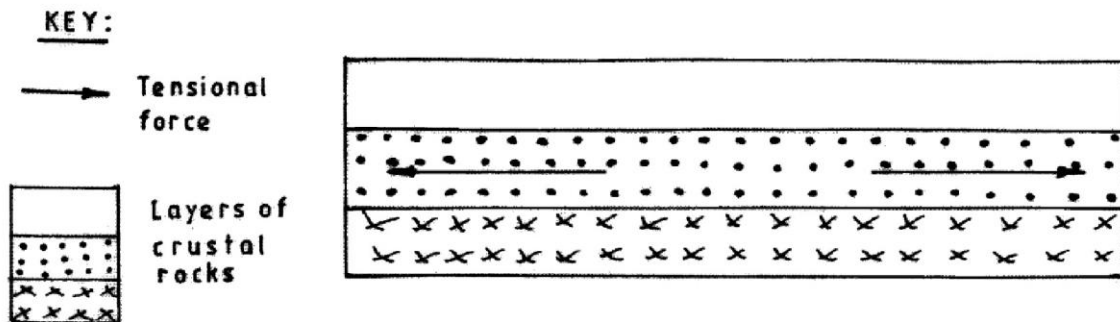
- Escarpments/scarp slopes.
- Tilt blocks.
- Fault steps.
- Block mountains/horst/fault block.

Any 3 x 1

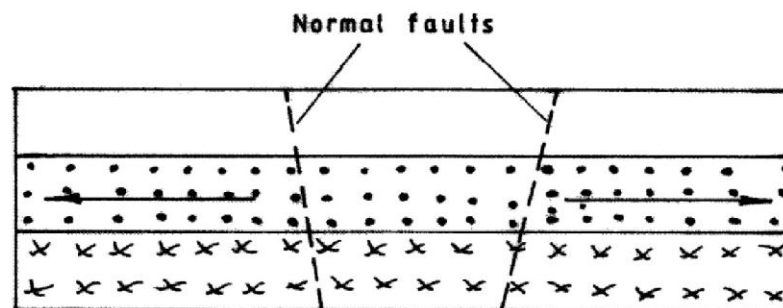
(3 marks)

(ii) With aid of diagrams, describe how the great Rift Valley may have been formed by tensional forces.

- Layers of rocks are subjected to tensional forces when there is some instability within the earth's crust.

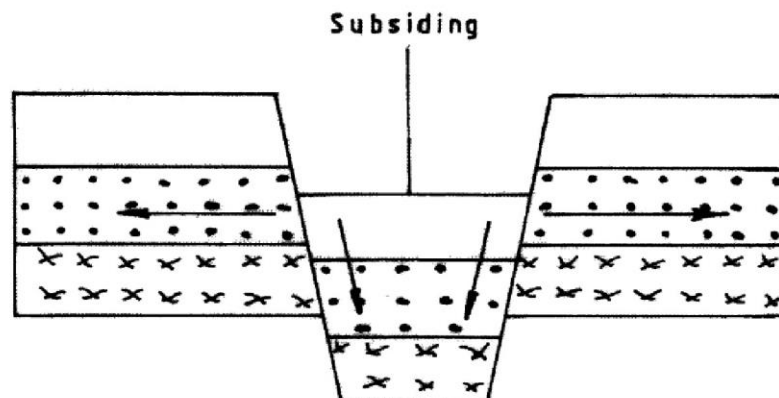


- Parallel normal faults/parallel lines of weakness develop.



- With time, the middle part sinks/subsides as the side blocks are pulled apart.

Diagram



- The sunken middle part forms a depression/trough known as the Rift Valley.

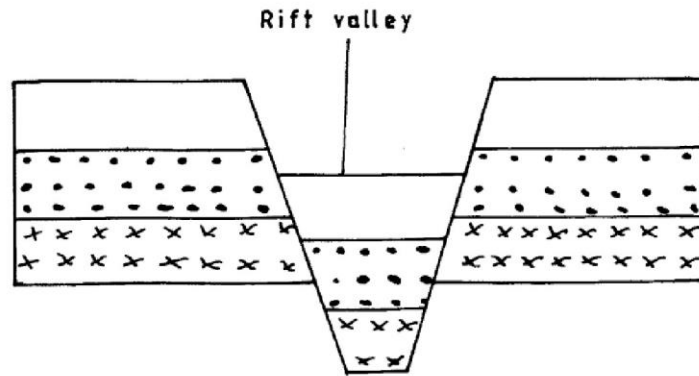


Diagram	4 x 1	(4 marks)
Text	4 x 1	(4 marks)

- (b) Explain **three** ways in which faulting may influence drainage systems.

- Uplifting of landscape which leads to faulting may cause rivers to reverse their direction of flow/ back tilting.
- Vertical faulting across a river may cause a change in the local base level resulting in the formation of a waterfall.
- Basins/depressions resulting from faulting may be filled with water to form lakes/inland drainage basins.
- Some rivers flow along fault lines forming fault guided drainage patterns.
- Some rivers may disappear into the ground through a fault forming underground streams.
- Uplift of some river channels may cause river rejuvenation.
- Faulting may expose underground water leading to formation of springs.

Any 3 x 2

(6 marks)

- (c) Describe **four** ways in which features resulting from faulting are of significance to the economy of Kenya.

- Highlands /fault blocks formed through faulting are sources of rivers which provide water for agricultural/domestic/industrial use.
- Faulting leads to formation of features that form beautiful scenery which promote tourism.
- Faulting leads to the formation of lakes that are important fishing grounds/mining sites / irrigation.
- Faulting has led to exposure of minerals that are mined to generate income.
- The highlands formed through faulting influence the formation of relief rainfall on the windward side which favours agriculture/forestry/ settlement.
- Formation of faults scarps creates deep faults which are passages of steam jets that are harnessed to generate geothermal power.
- Fault scarps lead to the formation of natural waterfalls which are suitable sites for HEP production.

Any 4 x 2

(8 marks)

9. (a) (i) Apart from alternate wetting and drying, name **three** other processes of mechanical weathering.
- Exfoliation/onion peeling/spalling
 - Block disintegration/block separation
 - Pressure release
 - Granular disintegration
 - Frost action
 - Crystal growth
- Any 3 x 1 (3 marks)
- (ii) Describe the following processes of weathering:
- **Alternate wetting and drying**
 - During the wet season surface rocks such as clay/shale absorb water causing them to swell.
 - During the dry season these rocks dry out causing the outer surface to shrink.
 - Repeated wetting and drying weakens the rocks leading to cracking/slaking.
 - These rocks break away from the main rock.

Any 3 x 1 (3 marks)
 - **Hydrolysis**
 - This is a process in which hydrogen ions/hydroxyl ions in water react with mineral ions in a rock.
 - This reaction leads to formation of new chemical compounds in the rocks.
 - With alteration of the original minerals, the rock becomes weak and disintegrates/decays.

Any 2 x 1 (2 marks)
 - **Carbonation**
 - It involves rain water dissolving carbon 4 oxide in the atmosphere forming a weak carbonic acid.
 - The carbonic acid reacts with calcium carbonate in rocks to form calcium bicarbonate solution.
 - Calcium bicarbonate solution is removed by running water.
 - This leads to the weakening/disintegration of the rock.

Any 3 x 1 (3 marks)
- (b) (i) State **three** conditions that influence the process of solifluction in mass wasting.
- The presence of a gentle slope.
 - The occurrence of alternating warm and cold season.
 - Presence of a permafrost layer/frozen ground/bedrock.
 - Unconsolidated saturated weathered materials/debris.
- Any 3 x 1 (3 marks)

(ii) Give **three** negative effects of mass wasting on the physical environment.

- Destruction of vegetation.
- Blockage of rivers/disruption of flow of rivers.
- Exposure of land to agents of soil erosion.
- Loss of life/property.
- Results in the formation of scars on the land/derelict land.

Any 3 x 1

(3 marks)

(c) You are planning to carry out a field study on types of mass wasting.

(i) Identify **three** methods you would use to collect data.

- Observation
- Photographing/video recording
- Interviewing
- Content analysis

Any 3 x 1

(3 marks)

(ii) Give **three** types of rapid mass wasting you are likely to observe during the field study.

- Mudflow
- Landslide/slump/debris slide/rock slide/rockfall/avalanche
- Earthflow

Any 3 x 1

(3 marks)

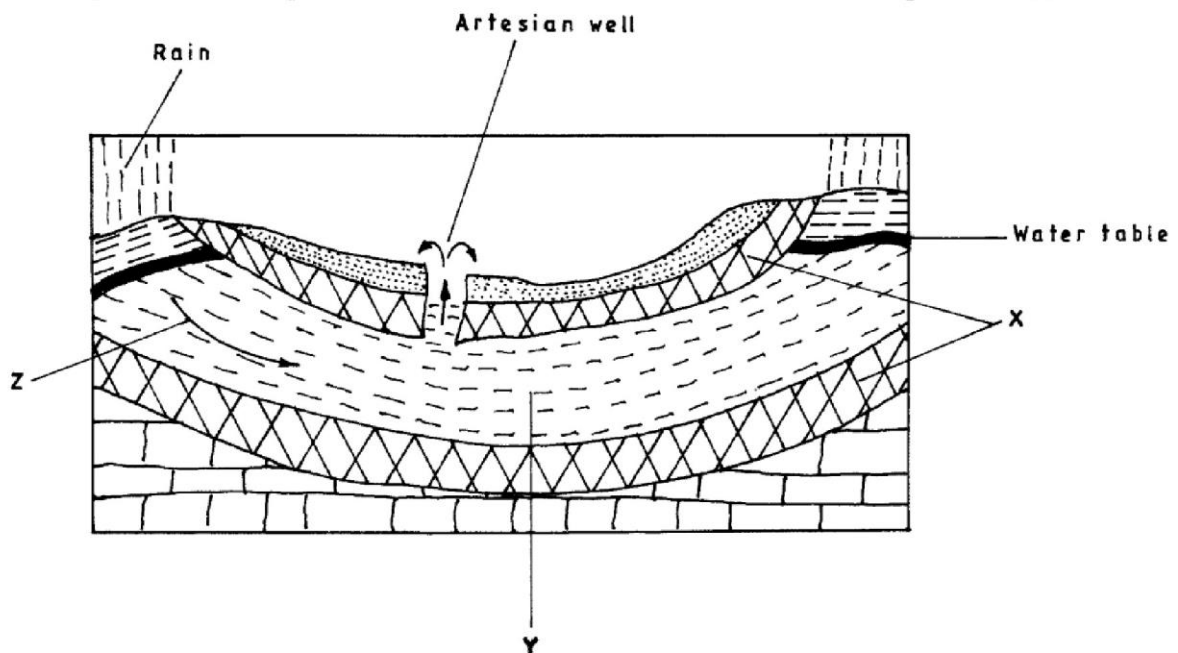
(iii) State two ways in which the information collected during the field study would be useful to the local community.

- It would be used to plan for precautions/safety
- It would be used in the conservation of land.
- It would be used as a basis for further research.

Any 2 x 1

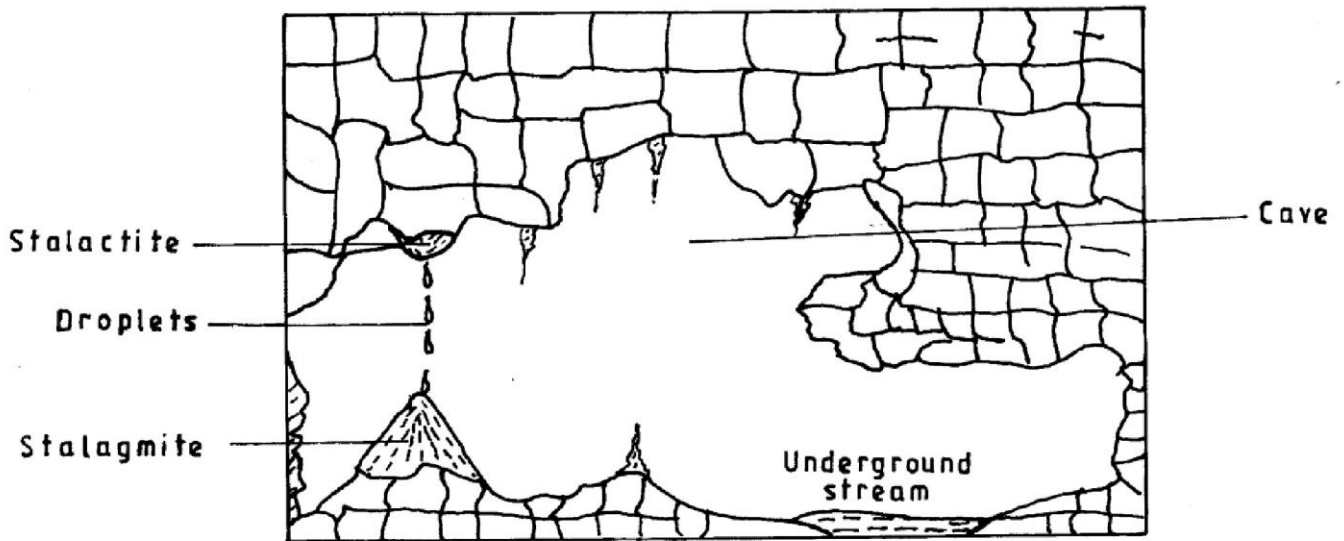
(2 marks)

10. The diagram below represents an artesian basin. Use it to answer question (a).



- (a) Identify:
- (i) the features marked x and y.
 x - Impermeable rocks (1 mark)
 y - Aquifer (1 mark)
- (ii) the process marked z.
 z - Percolation (1 mark)
- (b) Explain how the following factors influence the amount of underground water in limestone areas.
- (i) Rainfall
- When rains last for long hours it enhances infiltration thereby replenishing the underground water sources.
 - Heavy rains saturate the surface blocking air spaces thus reducing the rate of infiltration/leading to low amount of underground water.
 - Little rainfall/no rainfall leads to low amount of under ground water.
- Any 2 x 2 (4 marks)
- (ii) Vegetation cover
- Presence of vegetation cover reduces the speed of surface runoff hence increasing the rate of infiltration/leading to high amount of underground water.
 - Presence of vegetation cover breaks the force of raindrops giving water more time to infiltrate hence increasing the amount of underground water.
 - In areas of scanty vegetation/on bare ground the surface runoff is high hence reduce rate of infiltration/leading to low amount of underground water.
 - Presence of vegetation cover provide shade in the ground reducing direct loss of water through evaporation hence increasing the rate of infiltration leading to high amount of underground water.
- Any 2 x 2 marks (4 marks)
- (c) (i) Apart from stalagmites name **three** other underground features formed in limestone areas.
- Stalactites
 - Limestone/pillars/columns
 - Caves/caverns
 - Underground rivers
- Any 3 x 1 (3 marks)

(ii) With aid of a diagram, describe how a stalagmite is formed.



- A solution of calcium hydrogen carbonate drips down slowly through the roof of the cave/hang on the roof of the cave.
- As the solution continues to drip from the roof, it splashes on the floor of the cave.
- Water evaporates and the calcium carbonate precipitates.
- The precipitated calcium carbonate gradually builds upwards to form a Stalagmite.

Diagram

(5 marks)

Text

(5 marks)

(d) Give **three** reasons why there are few settlements in Karst landscapes.

- The areas have thin/poor soils.
- The areas are rocky/have rugged surfaces
- There is inadequate surface water supply.
- The areas have poor/scanty vegetation.

Any 3 x 1

(3 marks)