

KCSE PAPER 1 2022

5.2 GEOGRAPHY (312)

5.2.1 Geography Paper 1 (312/1)

SECTION A

| | | |
|--------|---|-----------------------|
| 1. (a) | <p>Give the three forces which have contributed to the geoid shape of the earth.</p> <ul style="list-style-type: none"> - Centrifugal force. - Centripetal force - Gravitational force | (3 marks) |
| (b) | <p>Name the minerals that make up the core of the earth.</p> <ul style="list-style-type: none"> - Iron - Nickel | (2 marks) |
| 2. (a) | <p>List two examples of extrusive igneous rocks.</p> <ul style="list-style-type: none"> - Pumice - Basalt - Obsidian - Trachyte - Rhyolite - Andesite - Phonolite - Tuff | Any 2 x 1 = (2 marks) |
| (b) | <p>Give three characteristics of sedimentary rocks.</p> <ul style="list-style-type: none"> - They form from pre-existing/original rocks. - They have cleavage/joints. - They form horizontal layers/are stratified - They are non-crystalline. - Some sedimentary rocks contain fossils - They have bedding planes | Any 3 x 1 = (3 marks) |
| 3. (a) | <p>Apart from aspect, list three other factors that influence the distribution of natural vegetation.</p> <ul style="list-style-type: none"> - Altitude - Terrain/slope/gradient - Drainage - Climate - Soils/Edaphic factors - Biotic factors - Human factors | Any 3 x 1 = (3 marks) |

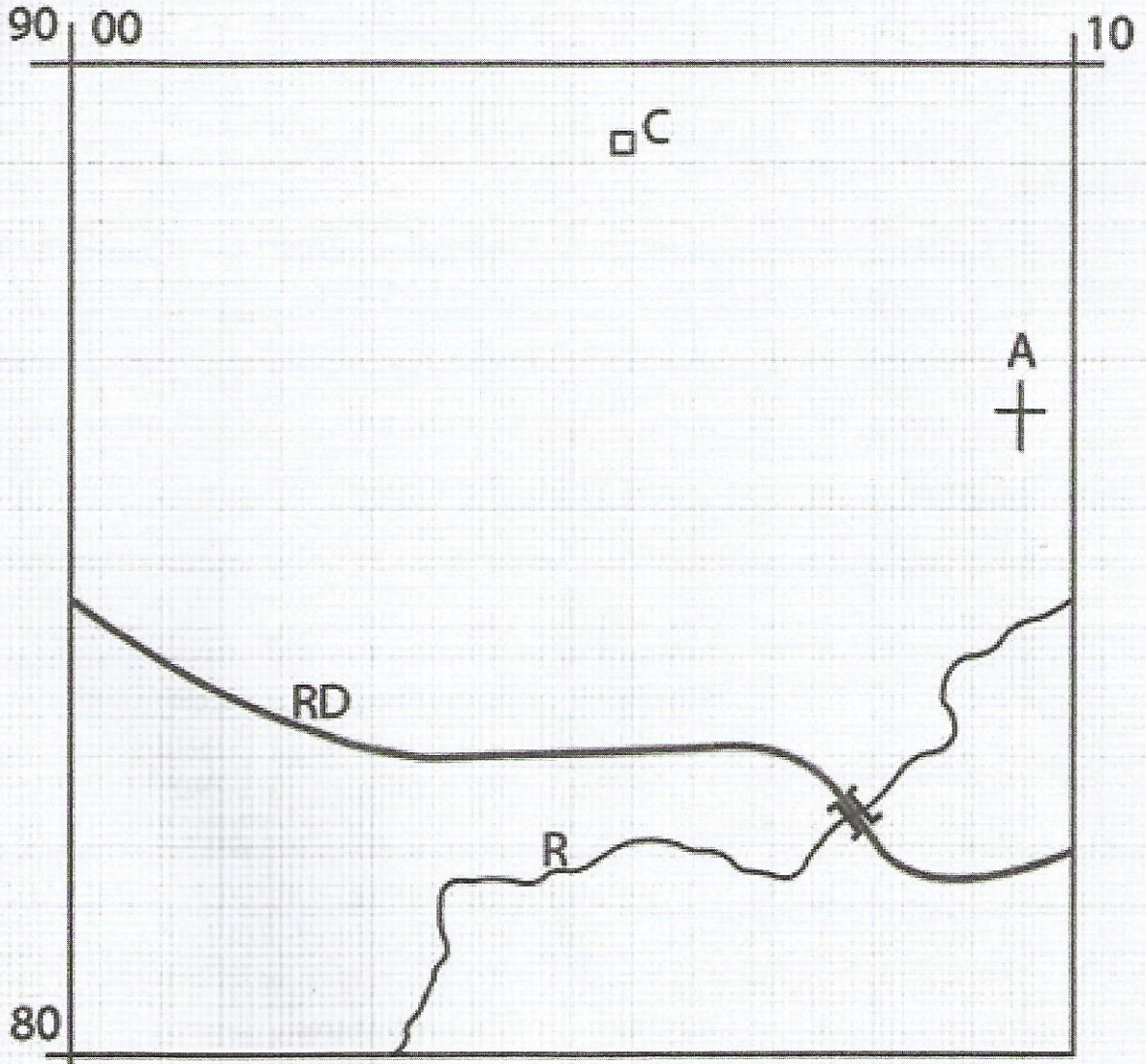
| | | |
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| (b) | <p>State two ways through which aspect influences the distribution of natural vegetation.</p> <ul style="list-style-type: none"> - Windward slope of mountains/hills support growth of a wide variety/dense vegetation. - The leeward side supports scanty vegetation. - The South facing slopes of temperate latitude areas of the Northern Hemisphere tend to favour luxuriant growth of forest, while the North facing slopes encourage the growth of grass./The North facing slopes of temperate latitude areas of the Southern hemisphere tend to favour luxuriant growth of forests;while south facing slopes encourage growth of grass. | Any 2 x 1 = (2 marks) |
| 4. (a) | <p>What is a mineral?</p> <ul style="list-style-type: none"> - It is an inorganic substance occurring naturally beneath/at earth's surface. | (2 marks) |
| (b) | <p>Classify the following rocks according to their formation:</p> <p>Marble - Metamorphic Granite - Igneous Mudstone - Sedimentary</p> | 3 x 1 = (3 marks) |
| 5. (a) | <p>Differentiate soil profile from soil catena.</p> <ul style="list-style-type: none"> - Soil profile is the vertical arrangement of the soil into layers/horizons from the surface to the bedrock, while soil catena is the sequence of different soils down a slope | (2 marks) |
| (b) | <p>State three ways in which soil texture is important.</p> <ul style="list-style-type: none"> - It influences the ease of plant root penetration into the soil - It regulates the soil water content. - It controls aeration of the soil. - It controls the availability and retention of nutrients within the soil. - It controls the size and spacing of pores in the soil. | Any 3 x 1 = (3 marks) |

SECTION B

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

| | | |
|--------|---|-----------------------|
| 6. (a) | <p>Study the map of Kisumu East 1:50,000 (Sheet 116/2) Provided and answer the following questions:</p> | |
| (i) | <p>Give the longitudinal extent of the area covered by the map $34^{\circ}45'E$ to $35^{\circ}00'E/15'$</p> | (1 mark) |
| (ii) | <p>Name the two three human-made features in the grid square 0193</p> <ul style="list-style-type: none"> - Main track (motorable track) - Plantation - Agricultural Department. - Houses - Built up areas | Any 3 x 1 = (3 marks) |
| (iii) | <p>Identify the methods used to show relief on the map.</p> <ul style="list-style-type: none"> - Contours. - Trigonometrical stations - Rock and cliff drawing/pictorial | (2 marks) |
| (iv) | <p>Calculate the area of Kisumu town. Give your answer in square kilometres.</p> <p>Complete squares = $5 \times 1 = 5 \text{ kms}^2$ Incomplete squares = $16 \times \frac{1}{2} = 8 \text{ km}^2$ Total area <u>13 kms (12.5-13.5kms)</u></p> | (2 marks) |
| (v) | <p>Name two types of natural vegetation found in the area covered by the map.</p> <ul style="list-style-type: none"> - Scrub - Scattered trees - Woodland - Papyrus | Any 2 x 1 = (2 marks) |
| (b) | <p>Draw a square 10cm by 10cm to represent the area enclosed by Eastings 00 and 10, and Northings 80 and 90. On it mark and name the following:</p> | |

SQUARE REPRESENTING THE AREA BOUND BY EASTINGS 00 AND 10, NORTHING 80 AND 90



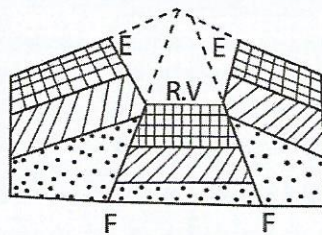
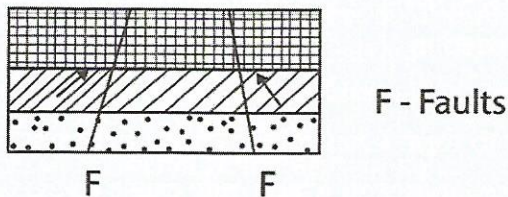
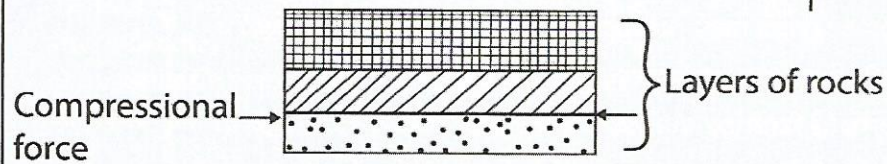
KEY

- A Air photo principal point (04)
- C Chiga market
- RD All weather road bound surface
- R River Ombeyi

Square- 1 Mark
Features- 1 mark each
Total (5 Marks)

| (c) | <p>Describe the distribution of settlement in the area covered by the map.</p> <ul style="list-style-type: none"> - There are few clustered settlements within the plantation. - There are are few/no settlements in the poorly drained areas/seasonal /swamp/winam gulf - Dense/clustered settlements are found within Kisumu town and the surroundings/market centres/well drained areas. - There is linear settlement along the roads. - There are no settlements on Nyando escarpment in the North East | Any 4 x 1 =(4 marks) | | | | | | | | | | | | | | |
|----------------|---|-----------------------|----------|----------------|-------------------------------|-------|------------------------|-----------|----------|--------------|---|---------|--------------------------|---------------|------------------------------|-----------------------|
| (d) | <p>Citing evidence from the map, give three economic activities carried out in the area covered by the map:</p> <table border="1" data-bbox="412 827 1175 1226"> <thead> <tr> <th>ACTIVITY</th> <th>EVIDENCE</th> </tr> </thead> <tbody> <tr> <td>Transportation</td> <td>Roads/motorable track/railway</td> </tr> <tr> <td>Trade</td> <td>Markets/trading centre</td> </tr> <tr> <td>Quarrying</td> <td>Quarries</td> </tr> <tr> <td>Crop farming</td> <td>Cotton ginnery/agricultural research stations/sisal factory/ Plantation</td> </tr> <tr> <td>Milling</td> <td>Flour mill/Sisal factory</td> </tr> <tr> <td>Communication</td> <td>Post office ireless station.</td> </tr> </tbody> </table> | ACTIVITY | EVIDENCE | Transportation | Roads/motorable track/railway | Trade | Markets/trading centre | Quarrying | Quarries | Crop farming | Cotton ginnery/agricultural research stations/sisal factory/ Plantation | Milling | Flour mill/Sisal factory | Communication | Post office ireless station. | Any 3 x 2 = (6 marks) |
| ACTIVITY | EVIDENCE | | | | | | | | | | | | | | | |
| Transportation | Roads/motorable track/railway | | | | | | | | | | | | | | | |
| Trade | Markets/trading centre | | | | | | | | | | | | | | | |
| Quarrying | Quarries | | | | | | | | | | | | | | | |
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| Milling | Flour mill/Sisal factory | | | | | | | | | | | | | | | |
| Communication | Post office ireless station. | | | | | | | | | | | | | | | |
| 7. (a) | <p>What is faulting?</p> <p>Faulting is a process of fracturing/breaking/cracking/ displacement of crustal rocks due to tensional/ compressional/shear/tectonic forces.</p> | (2 marks) | | | | | | | | | | | | | | |
| (b) | <p>Apart from the Rift Valley, name three other features that result from Faulting</p> <p>(i)</p> <ul style="list-style-type: none"> - Fault blocks/horst mountains/block mountains - Tilt blocks - Fault steps - Fault scarps/Escarpments - Depressions/Rift valley lakes | Any 3 x 1 = (3 marks) | | | | | | | | | | | | | | |

(ii) With the aid of well labelled diagrams, describe how the Rift Valley may be formed by compressional forces.



RV - Rift valley
 F - Reverse faults
 E - Removed by weathering and erosion

- Layers of rocks are subjected to compressional forces then there is some instability within the earth crust.
- Lines of weakness develop to form reverse faults.
- The compressional forces push the outer blocks towards each other.
- The middle block may remain static but at a lower level/sunk forming the floor of the Rift Valley.
- The overhanging parts of the outer blocks eventually collapse/ are eroded to form an escarpment.

Text (4 marks)
 Diagrams (4 marks)
 8 Marks

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| (c) | <p>Explain how faulting influences each of the following</p> <p>Drainage</p> <ul style="list-style-type: none"> - Some rivers may disappear into the ground through a fault forming underground streams. - Vertical faulting across a river may cause a change in the base level resulting in the formation of a water fall - Uplift of some parts of the river channel may cause river rejuvenation. - Basins/depressions resulting from faulting may be filled with water to form lakes/inland drainage basins. - Uplift of the landscape which may cause rivers to reverse their direction of flow - Faulting may expose underground water to form springs. - Faulting may expose underground water to form springs. - Faulting may cause a river to flow along a fault line leading to fault guided drainage pattern. | Any 3 x 2 = (6 marks) |
| | <p>Transport</p> <ul style="list-style-type: none"> - Presence of fault scarps makes it difficult/expensive to construct roads/railways across fault scarps. - When faulting occurs part of the land is disjoined, this disrupts forms of transport/pipelines/power lines/railway lines - Faulting may lead to subsidence of land which damages roads/railways/pipelines. - Fault features such as waterfall/cataracts become a barrier to water transport. - Faulting may occur across a ridge forming a pass where transport lines are constructed - Some rift valley lakes are used for water transport | |

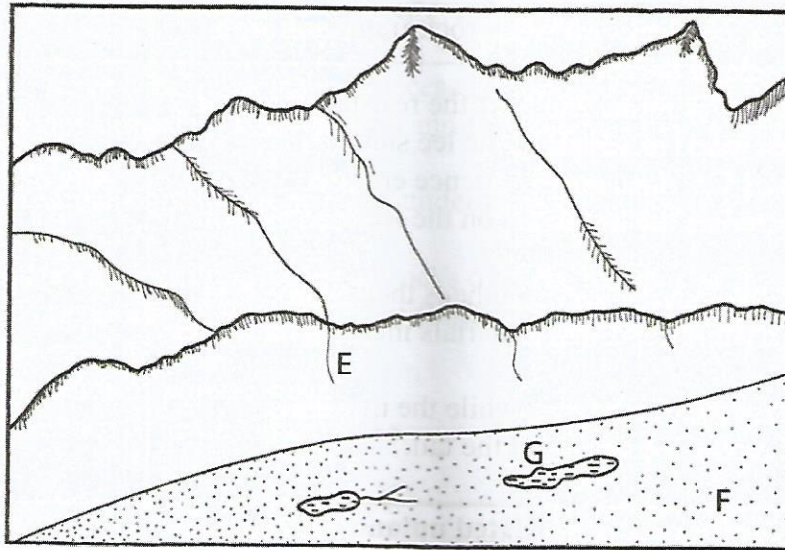
| 8. (a) (i) | <p>Name the instruments used to measure the following elements of weather</p> <p>Humidity - Hygrometer/psychrometer/wet and dry bulb thermometer</p> <p>Atmospheric pressure - Mercury barometer/Aneroid barometer</p> | <p>1 mark</p> <p>1 mark</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|--|-----------------------------------|-------|-----|-----|-----|-----|-----|-----|----|-----|-----|---|---|---|------------------|----|----|----|----|----|----|----|----|----|----|----|----|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|
| (ii) | <p>State three traditional methods of weather forecasting</p> <ul style="list-style-type: none"> - Observing movement of animals and migration of birds. - Observing changes in plants/shedding of leaves. - Observing heavenly bodies/appearance of the moon. - Observing changes in the wind patterns. - Observing changes in temperature/intensity of solar radiation. - Observing cloud cover/colour of the sky. - Appearance of a rainbow. | <p>Any 3 x 1 = (3 marks)</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (b) | <p>The statistical table below shows temperature and rainfall amounts for a given station X in Africa. Use it to answer question b(i) and b(ii)</p> <table border="1" data-bbox="297 898 1507 1062"> <thead> <tr> <th>Month</th> <th>J</th> <th>F</th> <th>M</th> <th>A</th> <th>M</th> <th>J</th> <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th> </tr> </thead> <tbody> <tr> <td>Temperature (°C)</td> <td>27</td> <td>27</td> <td>26</td> <td>25</td> <td>23</td> <td>22</td> <td>21</td> <td>21</td> <td>22</td> <td>23</td> <td>25</td> <td>26</td> </tr> <tr> <td>Rainfall (mm)</td> <td>366</td> <td>376</td> <td>452</td> <td>399</td> <td>264</td> <td>282</td> <td>302</td> <td>203</td> <td>132</td> <td>99</td> <td>117</td> <td>262</td> </tr> </tbody> </table> | | Month | J | F | M | A | M | J | J | A | S | O | N | D | Temperature (°C) | 27 | 27 | 26 | 25 | 23 | 22 | 21 | 21 | 22 | 23 | 25 | 26 | Rainfall (mm) | 366 | 376 | 452 | 399 | 264 | 282 | 302 | 203 | 132 | 99 | 117 | 262 |
| Month | J | F | M | A | M | J | J | A | S | O | N | D | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Temperature (°C) | 27 | 27 | 26 | 25 | 23 | 22 | 21 | 21 | 22 | 23 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rainfall (mm) | 366 | 376 | 452 | 399 | 264 | 282 | 302 | 203 | 132 | 99 | 117 | 262 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (i) | <p>Calculate:</p> <p>Annual range of temperature $27^{\circ}\text{C} - 21^{\circ}\text{C} = 6^{\circ}\text{C}$</p> <p>Total annual rainfall $366 + 376 + 452 + 399 + 264 + 282 + 302 + 203 + 132 + 99 + 177 + 262 = 3254 \text{ mm}$</p> | <p>(2 marks)</p> <p>(2 marks)</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (ii) | <p>Describe the climatic conditions of the station</p> <ul style="list-style-type: none"> - It experiences high rainfall totals /3254 mm annually - Temperatures are high throughout the year. - Low annual temperature range/6° C. - The wettest month is march/452mm - There is no dry month throughout the year/rainfall throughout the year. - October receives the lowest rainfall amount/99mm. | <p>4 x 1 = (4 marks)</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| <p>(c)</p> | <p>Explain how ocean currents influence the climate of adjacent coastal land.</p> <ul style="list-style-type: none"> - Moist winds blowing over a cold ocean current are cooled and condensed resulting in rainfall over the ocean. - The winds proceed to the adjacent coastal land as dry winds causing drying effect - Winds blowing over a warm ocean current are warmed and carry a warming effect to the adjacent coastal lands raise the temperatures. - When winds blow over a cold ocean current, they are cooled hence carrying a cooling effect to the adjacent coastal land/lowers the temperatures. - Winds blowing over a warm ocean current are warmed enabling them absorb more moisture leading to increased humidity/increase the amount of rainfall received on adjacent land. | <p>Any 3 x 2 = 6 marks</p> |
| <p>(d)</p> | <p>Explain three measures that can be taken to control desertification</p> <ul style="list-style-type: none"> - Controlling overgrazing by matching the number of animals kept with the land carrying capacity/ranching/paddock/selling some of the excess animals to protect the soils. - Constructing reservoirs in dry areas to store rain water/sink boreholes/diverting water from other areas which can be used for agriculture. - Afforestation/re-afforestation to increase/ improv vegetation cover/help sustain the water cycle/prevent soil erosion/soil degeneration. - Enforcing the laws on environmental conservation in order to manage the spread of deserts. - Reducing demand of wood fuel by providing alternative sources of energy/ use of energy saving jikos to save forests /trees. - Checking the advancement of sand dunes by planting barriers at the fringes of desert/ stabilizing the dunes by planting vegetation. - Planting drought resistant crops in arid areas to conserve soils. - Formation of government department and NGOs that promote environmental management/conservation as well as creating awareness on desertification to avoid spread of deserts. | <p>Any 3 x 2 = 6 marks</p> |
| <p>9. (a)</p> | <p>Apart from landslides, list the other two forms of rapid mass wasting.</p> <ul style="list-style-type: none"> - Earth flo - Mud flo - Avalanche | <p>2 marks</p> |

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| <p>(b)</p> | <p>Explain how each of the following factors facilitate mass wasting.</p> <p>Nature of the rock</p> <ul style="list-style-type: none"> - Massive rocks overlying weak rocks move/ slide faster along the slope. - Large rocks are likely to be overcome by gravity more easily than finely weathered materials - Steeply dipping rocks will easily experience movement. - When materials contain a lot of water they are lubricated/saturated and become susceptible to rapid movement. <p>Human activities</p> <ul style="list-style-type: none"> - Ploughing ,clearing of vegetation ,mining , quarrying affect the stability of surface materials causing their movement down slope. - External forces from moving vehicles/ earth tremors from explosives shake the ground causing some materials to move down slope. | <p>Any 2 x 2 = 4 marks</p> <p>Any 2 x 2 = 4 marks</p> |
| <p>(c)</p> | <p>Explain the effects of mass wasting on the environment.</p> <ul style="list-style-type: none"> - Landslides may cause rivers to change their course reducing the water volume downstream - Mass wasting leads to formation of derelict land with scars which spoils the beauty of the environment. - Mass wasting leads to retreat. - Some mass movement bury people and animals under large materials leading to loss of lives. - Landslides cause damage to property when materials cover roads/ farms/ homes. - Movement of materials down slope facilitates the loosening of the top soil increasing erosion. - Mass movement may create sceneries that may become tourist attractions. - Materials from landslides create barriers across a river valley forming a lake. - Mass wasting leads to formation of new land forms. - Mass wasting leads to the loss of plant life/vegetation/ biodiversity. - Materials deposited at the base of the slope form deep soils. | <p>Any 4 x 2 = 8 marks</p> |

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| <p>(d)</p> | <p>You intend to carry out a field study in an area affected by landslides within the vicinity.</p> <p>(i) Give three reasons why it is important to seek permission from the school administration.</p> <ul style="list-style-type: none"> - To enable the administration provide essential tools for use during the field study . - It is an official requirement - To enable the administration to take care of the disruptions of the school programme. - To enable the administration arrange for transport ,lunch. - To enable the administration to take the necessary safety precautions. | <p>Any 3 x 1 = 3 marks</p> |
| | <p>(ii) State the advantages of studying landslides through fieldwork</p> <ul style="list-style-type: none"> - It enables learners to apply the knowledge learned in the classroom. - It makes learning interesting/break classroom monotony - It helps learners to develop manipulative skills. - It enhances retention of memory. - It provides detailed/ in-depth/ broader learning. - It makes learning real/meaningful. | <p>Any 4 x 1 = 4 marks</p> |
| <p>10. (a) (i)</p> | <p>Name two mountains in East Africa that are ice capped.</p> <ul style="list-style-type: none"> - Mt Kenya. - Mt Kilimanjaro - Mt Ruwenzori | <p>(2 marks)</p> |
| <p>(ii)</p> | <p>Give two types of moraine</p> <ul style="list-style-type: none"> - Lateral. - Terminal/recessional - Medial - Englacial - Ground/subglacial - Dead ice | <p>(2 marks)</p> |

(b) The diagram below represents an upland glaciated landscape. Use it to answer question b (i).



Name the features marked

E-Truncated spur/waterfall

1 mark

F-Glacial trough/U-shaped valley

1 mark

G-Ribbon lake/finger lake

1 mark

(ii) Describe the formation of each of the following features.

- **Pyramidal peak**
- Ice accumulates in several cracks/ hollows on mountain sides.
- Ice exerts pressure on the cracks/ hollows.
- Plucking action of ice enlarges and steepens the hollows allowing more ice to collect in them.
- Abrasion leads to enlargement/deepens the cracks/ hollows making large basins called cirques/ corries.
- Moving ice plucks off loose rock materials from the basin thus enlarging them further.
- Nivation eats into the back wall of basins making them recede into the mountain side.
- Steep-sided knife-edged ridges/aretes are formed separating the basins.
- Three or more of these ridges/ aretes converge at the mountain top forming a jagged peak known as a pyramidal peak/ horn.

Any 6 x 1 = 6 marks

| | | |
|------------|---|----------------------------|
| | <ul style="list-style-type: none"> • Crag and tail - A large block of rock stands on the path of oncoming glacier. - The moving ice plucks off weak rock fragments from the upper side of the rock - As the ice moves round and over the resistance rock it carries the eroded materials to the lee side. - The leeward side does not experience erosion. - Eroded materials are deposited on the leeward side of the rock - With time the moving ice smoothens the upslope side of the rock while deposited materials increase on the lee side. - The resistant rock is the crag while the materials deposited on the lee side form the tail. | <p>Any 6 x 1 = 6 marks</p> |
| <p>(c)</p> | <p>Explain the significance of glaciated upland areas to human activities.</p> <ul style="list-style-type: none"> - Corrie lakes/ tarns, offer suitable areas for trout fishing - Glaciated mountains discourage human settlements hence growth of forests and therefore lumbering is practiced. - U-shaped valleys form natural route ways. - Fjord coastline, form deep well sheltered natural harbours/ good fishing grounds - Glaciated upland areas form magnificent features that encourage recreation/ tourism. - Waterfalls formed in glaciated uplands provide suitable sites for hydro-electric power production. - The warm glaciated valleys are suitable for livestock farming/ cultivation. - Glacial erosion exposes minerals leading to easier mining - Melt glaciers form rivers which provide water for domestic/industrial/agricultural/use. | <p>Any 3 x 2 = 6 marks</p> |