



312/1 MS  
GEOGRAPHY  
Paper 1  
MARKING SCHEME  
November 2023

THE KENYA NATIONAL EXAMINATIONS COUNCIL

KENYA CERTIFICATE OF SECONDARY EDUCATION

GEOGRAPHY

Paper 1

MARKING SCHEME  
(CONFIDENTIAL)

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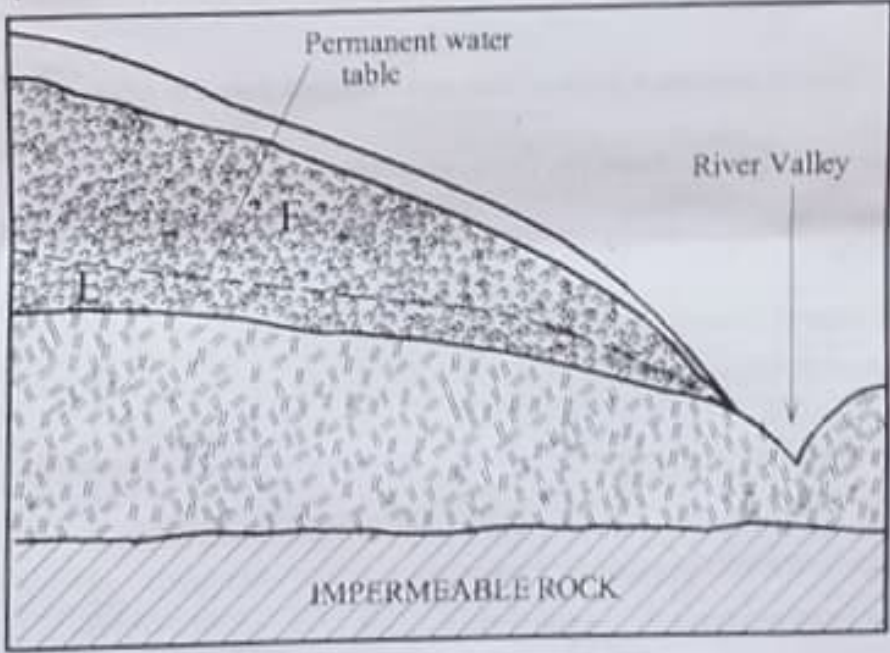
**This marking scheme consists of 13 printed pages.**

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**Turnover**

SECTION A

No	Marking Scheme	Marks
1.	<b>Differentiate between weathering and mass wasting.</b>	
(a)	Weathering is the breaking down/disintegration/decomposition of rocks in <u>situ</u> while mass wasting is the down slope movement of weathered materials under the influence of gravity. ✓✓	Any 2 x 1 = (2marks) 2 2
(b)	<b>Identify three ways in which temperature change influences physical weathering.</b> <ul style="list-style-type: none"> <li>- It causes block disintegration. ✓✓</li> <li>- <del>It causes frost action.</del> ✓✓</li> <li>- It causes exfoliation. ✓✓</li> <li>- It causes granular disintegration. ✓✓</li> </ul>	1st 3x1 3 3 Any 3 x 1 = (3marks)
2.	<b>Describe how a land breeze occurs.</b> <ul style="list-style-type: none"> <li>- During the night, the <u>land cools faster than the sea</u> since the land loses heat more rapidly. ✓</li> <li>- <u>High pressure develops over the land</u>, while <u>low pressure is created over the sea</u>. ✓</li> <li>- Warm air above the sea begins to rise. <u>causing low pressure</u>. ✓</li> <li>- Cool/cold air over the land flows <u>towards the sea</u> to replace the warm rising air. ✓</li> <li>- This movement of cool air from the land to the sea during the night is called land breeze. ✓</li> </ul>	5 5 (5marks)
3. (a)	<b>Distinguish between weather and climate.</b> Weather is the state/ <sup>condition</sup> of atmosphere of a given place at a given time/over a short period of time while climate is the average weather conditions of a place observed over a long period of time, over 30 years. ✓✓	2 2 (2marks)
(b)	<b>State three negative effects of desertification on the physical environment.</b> <ul style="list-style-type: none"> <li>- It leads to destruction of water catchment areas. ✓ <u>drying up of water bodies</u></li> <li>- It leads to drying up/destruction of vegetation. ✓</li> <li>- It leads to development of infertile soils, dry soils. ✓</li> <li>- It leads to development of dry soils. ✓</li> <li>- It leads to wind erosion. ✓ <u>(any erosion scars)</u></li> <li>- <u>Leads death/migration of animals</u>. ✓</li> </ul>	Any 3 x 1 = (3 marks) 1st 3x1 3 3 5

<p>4. (a)</p>	<p><b>State two factors that influence river erosion:</b></p> <ul style="list-style-type: none"> <li>- The volume of water ✓</li> <li>- The gradient of slope ✓ <i>Velocity</i> ✓</li> <li>- The nature of the bedrock ✓</li> <li>- The nature/amount of load ✓</li> </ul> <p style="text-align: right;"><i>1st 2x1</i></p>	<p style="text-align: right;"><i>2, 2</i> Any 2 x 1 = (2 marks)</p>
<p>(b)</p>	<p><b>Name the three types of sand dunes:</b></p> <ul style="list-style-type: none"> <li>- <i>Draas</i> ✓</li> <li>- Barchans ✓</li> <li>- <i>Star</i> ✓</li> <li>- Seif/longitudinal/Linear/Lateral/Tail ✓</li> <li>- Transverse/Wave/Ripples/Wake ✓ <i>1st 3x1</i></li> <li>- <i>Parabolic</i> ✓</li> </ul>	<p style="text-align: right;"><i>3, 3</i> Any 3 x 1 = (3 marks)</p>
<p>5. (a)</p>	<p><b>The diagram below shows zones of ground water. Use it to answer question 5 (a).</b></p> 	



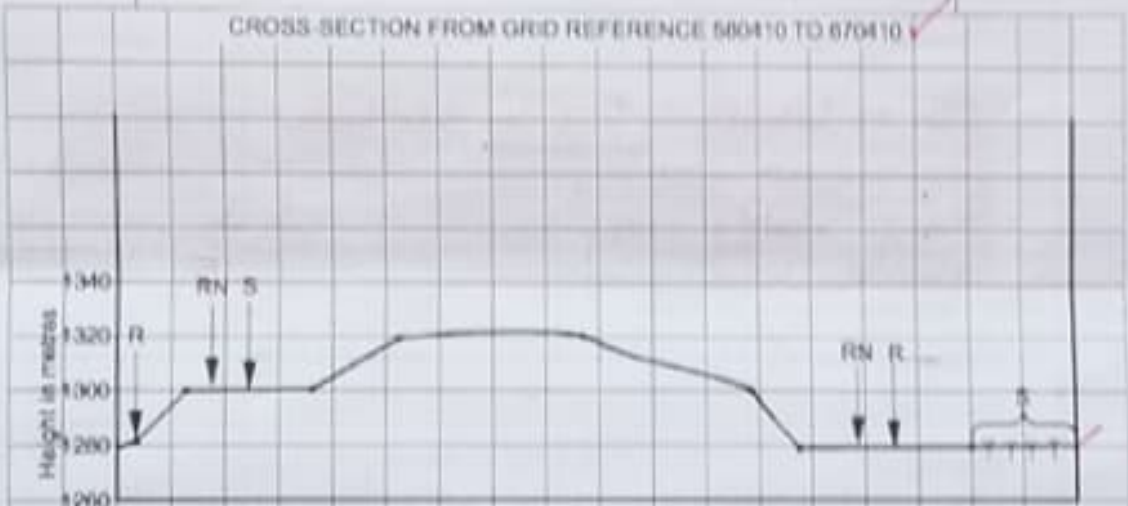
(a)	Name the zones marked E and F. E: zone of intermittent saturation; <i>Seasonal / Temporary / Temporal</i> F: zone of non-saturation	(1 mark) (1 mark)
State three conditions that favour the formation of an artesian basin.		
(b)	The aquifer must: - Be of same permeable / porous material. - Be sandwiched between two impermeable rocks. - Be exposed in an area with sufficient precipitation / water source. - Dip from a region of water intake / rock layers must form a broad syncline basin. - Have partial / total blockage sufficient for the water that comes in the higher portion of the aquifer.	<i>2 2</i> <i>3 3</i> <i>1st 3 x 1</i> <i>Any 3 x 1 = (3 marks)</i>

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

*25*

6.	Study the map of Mumias (Sheet No. 101/2) provided and answer the following questions.	
(a) (i)	Convert the scale of the map into statement scale. * 1 cm represents 50,000 cm $50,000 \text{ cm} = \frac{50,000}{100,000} \text{ km}$ $= 0.5 \text{ km}$ 1 cm represents 0.5 km	<i>2</i> <del>(2 marks)</del>
(ii)	Give the six figure reference for the school at Mungabo. * <del>503356</del> <i>502357</i> / <i>503357</i>	<i>2</i> <del>(2 marks)</del>
(iii)	Identify three types of natural vegetation found to the south of northing 36. - Woodland. - Scrub. - Scattered trees. - Riverine trees. - Papyrus swamp vegetation. - Thicket.	<i>3</i> <i>1st 3 x 1</i> <del>(3 marks)</del>

(iv) *	What is the bearing of the school at Khamashia from the school Ithonje? (061, 062, 063) 062° ✓ 111° (N 61E - N 63E)	2.5 (2 marks)
(b)	Using a vertical scale of 1 cm to represent 20 m, draw a cross-section from grid reference 580410 to 670410. On the cross-section, mark and name: (i) all weather road loose surface (ii) riverine trees (iii) river Nzoi (iv) seasonal swamp.	(1 mark) (1 mark) (1 mark) (1 mark)



R	All weather road loose surface	1 mark	(KS - 1) T - 1 RN - 1 S - 1 4 marks
T	Riverine trees	1 mark	
RN	river Nzoi	1 mark	
S	Seasonal swamp	1 mark	
KS	Starting & Ending point	1 mark	(RT - 1) RN - 1 S - 1 4 (Total 7 marks)
RT		1 mark	
RN		1 mark	
S		1 mark	7.7

<p>(c) *</p>	<p>Citing evidence from the map, explain two factors favouring trading in the area covered by the map.</p> <ul style="list-style-type: none"> <li>- Presence of many markets/trading centres/shops provide opportunities for trade ✓</li> <li>- The dense settlements show that there is high demand for goods/market.</li> <li>- Presence of dense road network that provides means of transport for goods. ✓</li> </ul>	<p>44 2x2 = (4 marks)</p>
<p>(d)</p>	<p>Describe the relief of the area covered by the map.</p> <ul style="list-style-type: none"> <li>- The land rises from S.W to S.E/N.E. / slopes from N.E to S.W ✓</li> <li>- The landscape is generally dissected by many river valleys/narrow river valleys.</li> <li>- The land along river Nzoia is generally low/wide/broad valley.</li> <li>- There are islands/islets along River Nzoia ✓</li> <li>- The highest point/altitude is approximately 1368 metres ✓</li> <li>- There are several spurs ✓</li> <li>- The lowest altitude is approximately 1200 metres ✓</li> <li>- There is a col (or gap) ✓</li> <li>- The land is gently sloping ✓</li> <li>- There are hills ✓</li> </ul>	<p>55 Any 5 x 1 = (5 marks)</p>
<p>7. (a)(i)</p>	<p>Give three sources of lake water.</p> <ul style="list-style-type: none"> <li>- Rainfall/water ✓</li> <li>- Rivers ✓</li> <li>- Melting ice ✓</li> <li>- Underground water (magmatic spring) ✓</li> </ul>	<p>3 Any 3 x 1 = (3 marks)</p>
<p>(ii)</p>	<p>State three characteristics of lakes formed due to faulting.</p> <ul style="list-style-type: none"> <li>- They are steep sided ✓</li> <li>- Most of them are long ✓</li> <li>- Most are narrow ✓</li> <li>- Most are deep. / Some are shallow ✓</li> <li>- Most of them are salty. / Some are fresh ✓</li> <li>- Most lack outlets ✓</li> </ul>	<p>36 Any 3 x 1 = (3 marks)</p>

<p>(b)</p> <p>(i)</p> <p>(ii)</p>	<p><b>Describe how the following lakes are formed:</b></p> <p><b>Moraine dammed:</b></p> <ul style="list-style-type: none"> <li>- A mass of ice approaches a wide low lying area;</li> <li>- Ice starts to melt at the edge;</li> <li>- This leads to deposition of terminal moraine across the valley resulting to a <u>transverse ridge</u>; (barrier)</li> <li>- More deposition of the terminal moraine raises the transverse ridge;</li> <li>- As the ice melts, the melt waters accumulates behind the ridge;</li> <li>- The glacier continues to retreat towards the snow field as it is melting;</li> <li>- <u>The water</u> that accumulates behind the ridge of terminal moraine forms a moraine dammed lake.</li> </ul> <p><b>Lagoon</b></p> <ul style="list-style-type: none"> <li>- Sand/shingle are moved by the longshore drift and deposited at the <u>entrance of the bay</u>;</li> <li>- The deposits gradually accumulate forming a spit/sand bar/ridge;</li> <li>- The continued deposition elongates the spit, eventually linking the two headlands to form a bay bar;</li> <li>- The bay bar separates part of the sea water from the open sea;</li> <li>- The enclosed sea water is the lagoon.</li> </ul>	<p>(7 max 06) 6</p> <p><del>any 6 x 1 = (6 marks)</del></p> <p>5 11</p> <p>(5 marks)</p>
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<p>(c) *</p>	<p><b>Explain four ways in which lakes influence the climate of the surrounding areas.</b></p> <ul style="list-style-type: none"> <li>- Lake breezes have a <u>cooling effect</u> on the surrounding land especially in the afternoons. ✓✓</li> <li>- Moisture from evaporation leads to <u>convictional rainfall</u> mainly in the afternoon, <u>increase amount of rainfall received in the area</u>. ✓✓</li> <li>- The high rates of evaporation lead to a <u>high relative humidity</u> in the area. ✓✓</li> <li>- <u>Evaporation from the lakes lead to increased cloud cover</u>. ✓✓</li> <li>- The lake breezes leads to moderated temperatures hence a <u>low diurnal range of temperature</u> all year round. ✓✓</li> <li>- The lake/lake breezes may <u>strengthen/divert/reverse</u> prevailing winds. ✓✓</li> </ul> <p><i>During cold season, lake breeze may bring warming effect on the land.</i></p>	<p>Any 4 x 2 = (8 marks)</p>
<p>8. (a) (i) *</p>	<p><b>What is glaciation?</b></p> <p>Glaciation is the process by which moving ice erodes, transports and deposits materials on the earth surface. ✓✓</p> <p><i>Glaciation is the action of moving ice.</i></p>	<p>8 8 25 2 (2 marks)</p>
<p>(ii) *</p>	<p><b>Explain three negative effects of glaciation on human environment.</b></p> <ul style="list-style-type: none"> <li>- The boulder clay deposited creates marshy landscape due to poor drainage making it unsuitable for human settlement. ✓✓</li> <li>- The infertile soil deposited makes it unsuitable for agriculture. ✓✓</li> <li>- The numerous lakes formed in the lowlands reduces the land available for use. ✓✓</li> <li>- Glaciation results into rugged landscape making construction of transport networks <u>difficult</u>. ✓✓</li> <li>- <u>Glacial deposits may bury minerals making mining difficult/expensive.</u></li> <li>- <u>Avalanches may lead to destruction of properties/loss of life.</u></li> </ul>	<p>6 6 Any 3 x 2 = (6 marks)</p>



<p>(b) (i)</p>	<p><b>Give three ways in which ice moves.</b></p> <ul style="list-style-type: none"> <li>- <u>Internal shearing</u> ✓</li> <li>- Basal slip. ✓</li> <li>- Plastic flowage. ✓ <u>Intergranular movement</u></li> <li>- Extrusion flow. ✓ <u>1st 3x1</u></li> </ul>	<p>(3 marks)</p>
<p>(ii)</p>	<p><b>Explain two factors that influence movement of ice.</b></p> <ul style="list-style-type: none"> <li>- <b>Gradient:</b> Ice move faster on steep slopes than on gentle slopes due to the force of gravity. ✓</li> <li>- <b>Seasons:</b> Ice movement is faster in warmer areas /summer due to melt waters which acts as lubricant; ✓ <u>Temp. change</u></li> <li>- <b>Friction:</b> The Centre part of a glacier moves faster than the bottom and sides due to reduced friction/resistance. ✓ <u>Nature of the surface</u></li> <li>- <b>Thickness/weight of glacier:</b> Thick masses of ice exert great pressure on the layers beneath inducing melting hence faster movement. ✓</li> </ul> <p><u>Width of glacial valley - Ice moves faster in narrow valleys. slower in wide valleys.</u></p>	<p>KB can f → scales, independent e → cannot scale on its own.</p> <p>Any 2 x 2 = (4 marks)</p>
<p>(c) (i)</p>	<p><b>Describe how each of the following features is formed.</b></p> <p><b>Outwash plain:</b></p> <ul style="list-style-type: none"> <li>- <u>Large ice stagnates on gently sloping lowland/landscapes</u> ✓</li> <li>- Large ice sheets melt on gently sloping lowlands, along the edges and at the bottom. ✓</li> <li>- The melt waters flow beyond the terminus carrying along <u>fine rock</u> materials; ✓</li> <li>- The melt waters deposit the <u>fine rock</u> materials as it flows; ✓</li> <li>- The fluvial glacial materials deposited fill in the pre-existing valley/depressions; ✓</li> <li>- The retreat of the ice sheet leaves behind an undulating plain of unconsolidated materials/silt/sand/gravel called an outwash plain. ✓ <u>The loose clay, sand &amp; gravel are deposited in sorted/stippled order with the coarser materials first while fine ones wash further away.</u></li> </ul>	<p>(4 marks)</p>
<p>(ii)</p>	<p><b>Roche moutonee:</b></p> <ul style="list-style-type: none"> <li>- When an ice sheet erodes a low lying area and comes across a resistant rock; ✓ <u>is at a rate</u></li> <li>- The resistant rock erodes <u>slowly</u> than the surrounding rocks; ✓</li> <li>- The upstream is eroded more through <u>abrasion</u>; ✓</li> <li>- On the downstream side, the ice erodes mainly by <u>plucking</u>; ✓</li> <li>- When the ice retreats, the underlying resistant rock is exposed; ✓</li> <li>- Consequently, the outcrop rock has a gentle and smooth <u>upstream</u> side while the downstream is steep and rugged forming a Roche's moutonee. ✓</li> </ul>	<p>(6 marks)</p>

6/10  
25

<p>9. (a)</p>	<p><b>Give two reasons why wind is more active in the hot deserts.</b></p> <ul style="list-style-type: none"> <li>- The presence of loose unconsolidated materials that are easily acted upon by the wind;</li> <li>- The wind occurs in form of strong tropical storms;</li> <li>- There is limited vegetation cover. ✓ No vegetation</li> </ul> <p>1<sup>st</sup> 2x1</p>	<p>2 2 <del>Any 2 x 1 (2 marks)</del></p>
<p>(b)</p> <p>(i) <b>Mushroom block:</b></p> <p>(ii) <b>Yardangs:</b></p>	<p>It is formed from a <u>homogenous rock</u> which lies vertically on the path of the prevailing wind;</p> <p>There is wind abrasion by heavier materials near the ground resulting into intensive <u>undercutting</u> of the rock;</p> <ul style="list-style-type: none"> <li>- The top of the rock undergoes <u>polishing and smoothening</u> by fine airborne materials;</li> <li>- This results into a feature with a broad rounded top and a very narrow base/bottom known as mushroom block.</li> </ul> <p>They are formed by massive alternating layers of hard and soft rocks which are <u>vertical/near vertical</u>;</p> <ul style="list-style-type: none"> <li>- <u>The rocks lie parallel to the direction of prevailing wind</u>;</li> <li>- Wind <u>abrasion</u> acts on the soft layers;</li> <li>- The worn out materials are removed and transported by <u>deflation</u>;</li> <li>- The hard layers are left standing out as small <u>ridges</u> separated by furrows forming features known as yardangs.</li> </ul>	<p>4 <del>(4 marks)</del></p> <p>4 8 <del>Any 4 x 1 (4 marks)</del></p>

Homogenous rock  
Abrasion (heavier & softer)  
Smoothing (wider & softer)  
Features

- Extensive desert landscapes forms ideal sites for film making ✓
- Extensive " " " is appropriate sites for testing cars ✓
- Sand is harvested for building and construction ✓

<p>(c) *</p>	<p><b>Explain three ways in which features resulting from wind action in arid areas are important.</b></p> <ul style="list-style-type: none"> <li>- Water from the oasis is used for irrigation/domestic/industrial purposes; <i>deflation hollow ✓</i></li> <li>- Desert landscapes are ideal for military training/testing of weapons since they have few settlements; ✓</li> <li>- Wind-blown dust produces loess deposits which are deep, fertile and well drained hence suitable for crop growing; ✓</li> <li>- Features resulting from wind action form beautiful scenery that attracts tourists. ✓</li> </ul>	<p><del>Any 3 x 2 = (6 marks)</del></p> <p><u>1<sup>st</sup> 3x2</u>      <b>66</b></p>
<p>(d)</p>	<p><b>Some students carried out a field study on wind deposition features in an arid area in Kenya.</b></p> <p>(i) <b>Name three secondary sources of information they are likely to have used in preparing for the study.</b></p> <ul style="list-style-type: none"> <li>- Text books. ✓</li> <li>- <del>Notes/Handouts</del> ✓</li> <li>- Magazines/journals/pamphlets/periodicals./Newspapers ✓</li> <li>- Photographs/video <del>tapes</del> ✓ <i>slides/Films/video clips</i></li> <li>- Maps ✓</li> <li>- <del>Internet/Electronic media for the student</del> ✓ <i>1<sup>st</sup> 3x1</i></li> </ul>	<p><del>Any 3 x 1 = (3 marks)</del></p> <p><b>3</b></p>
<p>(ii)</p>	<p><b>State three reasons why it was necessary to visit the area before the actual field study.</b></p> <ul style="list-style-type: none"> <li>- <i>To determine the suitability of area for study. ✓</i></li> <li>- To familiarize with the area of study. ✓</li> <li>- <i>To help in drawing a route map. ✓</i></li> <li>- To help identify methods of data collection. ✓</li> <li>- <i>To help adjust objectives &amp; hypothesis. ✓</i></li> <li>- To be able to identify relevant equipment for data collection. ✓</li> <li>- <i>To seek permission from relevant authorities. ✓</i></li> <li>- To identify any problems likely to be encountered. ✓</li> <li>- To estimate the cost of the study. ✓</li> <li>- To assist preparing a working schedule. ✓ <i>1<sup>st</sup> 3x1</i></li> </ul>	<p><del>Any 3 x 1 = (3 marks)</del></p> <p><b>3</b></p>
<p>(iii)</p>	<p><b>Give three advantages of studying wind depositional features through field work.</b></p> <ul style="list-style-type: none"> <li>- It enables one to acquire knowledge/skills. <i>(problem solving skills/critical thinking)</i> ✓</li> <li>- It makes learning real. ✓</li> <li>- It makes learners to understand better the concept learnt in class. ✓</li> <li>- It breaks the monotony/makes learning interesting. ✓</li> <li>- The learners get first-hand information. ✓</li> <li>- It enhances retention of information. ✓ <i>1<sup>st</sup> 3x1</i></li> </ul>	<p><del>Any 3 x 1 = (3 marks)</del></p> <p><b>3</b></p>

- It help learners apply knowledge learnt in class *3* 9  
25      11

10. (a)	<b>Classify soils according to order.</b> <ul style="list-style-type: none"> <li>- zonal ✓</li> <li>- azonal ✓</li> <li>- Intrazonal ✓</li> </ul>	<p style="text-align: right;">33 (3 marks)</p>
(b)	<b>Explain how the following factors influence soil formation.</b> (i) <b>Parent rock:</b> <ul style="list-style-type: none"> <li>* - Nature of parent rock determines the <u>mineral composition</u> of the soil. ✓✓</li> <li>- Resistant/hard parent rock result in <u>coarse grained soils</u>/soft rocks lead to fine textured soils. ✓✓</li> <li>- The minerals in the parent rock determine the <u>soil colour</u> while young. ✓✓</li> <li>- The nature of parent rock influences the <u>rate of weathering</u>, in that soft rocks weather fast while hard rocks weather slowly. ✓✓</li> </ul>	<p style="text-align: right;">4 Any 2 x 2 = (4 marks)</p>
(ii)	<b>Climate:</b> <ul style="list-style-type: none"> <li>* - Rain water influences chemical and physical weathering leading to formation of soils through rock break up/decay. ✓✓</li> <li>- Rainfall causes <u>leaching</u> resulting to laterite soils. ✓✓</li> <li>- High temperatures facilitates chemical/physical weathering causing faster formation of soils. ✓✓ <i>low temps. slow rate of soil formation.</i></li> <li>- High temperatures quicken decay forming the <u>organic matter</u> in soils. ✓✓</li> <li>- Wind may expose parent rocks to weathering processes/erode loose soil particles making them thin. ✓✓</li> <li>- Wind/<del>water</del> <sup>rainwater</sup> may deposit light particles that accumulate to form soils. ✓✓</li> </ul>	<p style="text-align: right;">6 10 Any 3 x 2 = (6 marks)</p>
(c)	<b>State five economic uses of soil.</b> <ul style="list-style-type: none"> <li>- Some soils are used in making ceramics/pottery/brick making. ✓</li> <li>- Soil is a medium through which natural vegetation and <u>crops grow</u>. ✓</li> <li>- Soil may contain <u>valuable minerals</u>. ✓</li> <li>- Some soils are used for road construction/laying foundation to structures. ✓</li> <li>- Some soils are consumed by livestock/<u>human beings</u>. ✓</li> <li>- Some soils are used as raw materials in the building and construction industry. ✓</li> <li>- <i>Organic soils like peat serve as fuel resources.</i> ✓</li> <li>- <i>Some soils have medicinal values.</i> ✓</li> </ul>	<p style="text-align: right;">5 5 Any 5 x 1 = (5 marks)</p>

<p>(d)</p> <p>(i)</p> <p>*soils - collection - recording</p>	<p>Students in a secondary school intend to carry out a field study on soils within their local environment.</p> <p>Give three activities the students are likely to carry out during the study.</p> <ul style="list-style-type: none"> <li>- Tasting the pH of the soils ✓</li> <li>- Collecting/labelling samples of soil. ✓</li> <li>- Measuring soil temp./depth ✓</li> <li>- Taking notes ✓</li> <li>- Feeling soil texture ✓</li> <li>- Taking photographs/videos of the soils.</li> <li>- Field sketching/drawing diagrams ✓</li> <li>- Asking and answering questions.</li> <li>- Administering/filling the questionnaire ✓</li> <li>- Filling the questionnaire ✓</li> </ul> <p>observing soil colour/profile/structure ✓</p>	<p>Any 3 x 1 = (3 marks)</p>
<p>(ii)</p>	<p>List four properties of soil you would study.</p> <ul style="list-style-type: none"> <li>- Texture ✓</li> <li>- Structure ✓</li> <li>- Colour ✓</li> <li>- Air ✓</li> <li>- Moisture content ✓/soil water</li> <li>- Porosity/permeability ✓</li> <li>- Temperature</li> <li>- Thickness ✓</li> <li>- Soil pH/Lime content ✓</li> <li>- Organic matter/Humus ✓</li> </ul>	<p>Any 4 x 1 = (4 marks)</p>

1 4 x 1

4 | 7  
25