

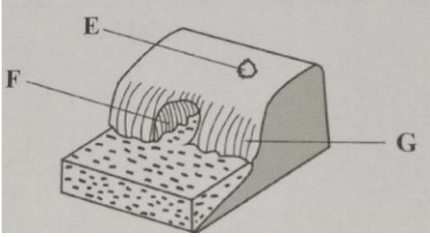
312/1
GEOGRAPHY
PAPER 1
MARKING SCHEME
MARCH 2021

THE KENYA NATIONAL EXAMINATION COUNCIL
KENYA CERTIFICATE OF SECONDARY EDUCATION
GEOGRAPHY
PAPER 1

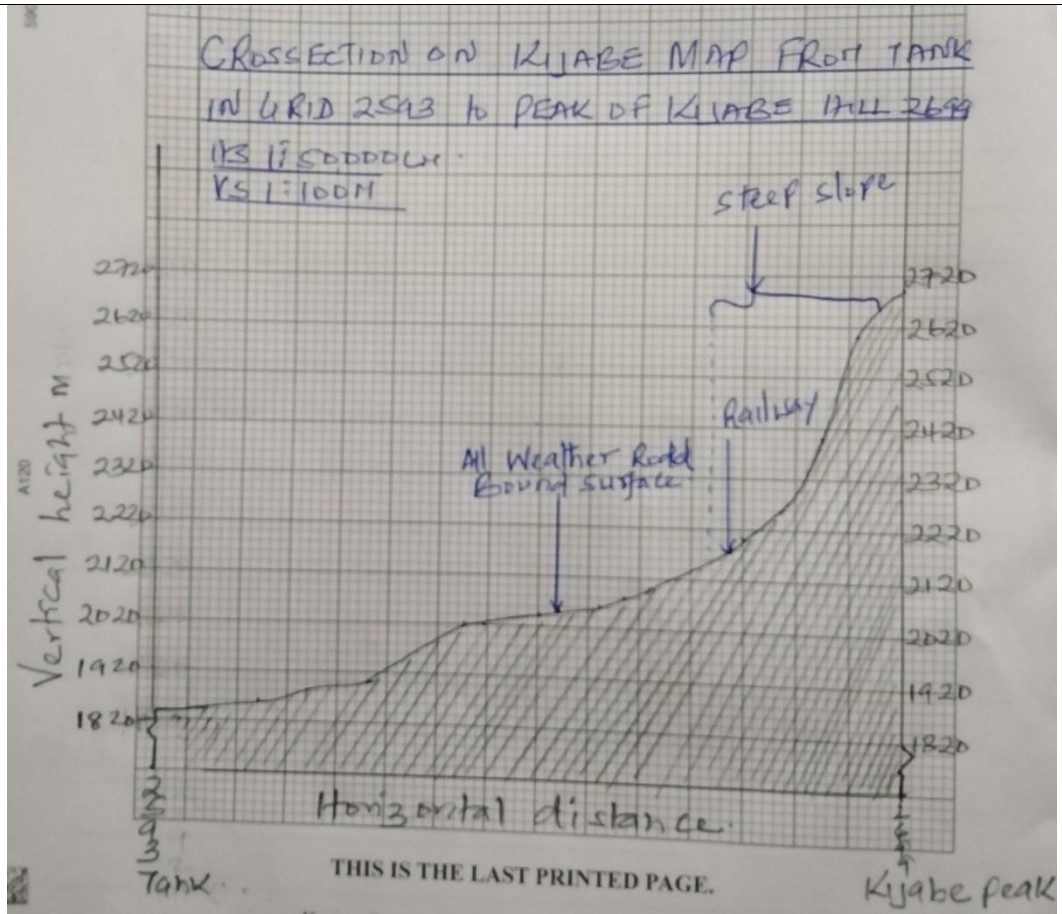
COORDINATED MARKING SCHEME
(CONFIDENTIAL)

QUESTION ITEM	QUESTION	POSSIBLE ANSWERS AND MARKING POINT	JUSTIFICATION
1(a)	Define the term <i>environment</i>	It's a place, site, situation, surrounding, setting or domain with conditions that influence the behaviour of any organism.	
		All conditions surrounding an organism and has influence on its behaviour	
1(b)	Two divisions of <i>physical geography</i>	Geomorphology Climatology Meteorology Pedology Geology Hydrology Oceanography	Branch of geography dealing with natural features and processes
2(a)	Three characteristics of comets	They orbit around the sun They have a nucleus within the head They have a head surrounding the nucleus It has a tail always pointing away from the sun It sublimates as it nears the sun due to sun's heat Carbon dioxide, water ices silicates and fine dust are its main components	Check if the student captured traits while in motion or stationary

2b	Proofs to show that the shape of the earth is spherical	<p>During lunar eclipse the shape of the shadow of the earth casted on the moon surface is spherical in shape</p> <p>At the coast the approaching vessels the topmost part of vessels will appear first before the whole body of the vessel is seen, if the earth was flat the whole vessel will be seen wholly once</p> <p>Photographs taken by space satellites shows the earth to be spherical in shape</p> <p>On any high tower on the earth surface, the horizon of the earth appears curved</p> <p>A plane set flying fast in a straight line will eventually find if self where it started without flying back this will never happen if the earth was flat</p> <p>All other planets are spherical in shape the earth being one of them it must also be spherical</p> <p>The rising and setting of the sun is a strong evidence that our earth is spherical</p>	Each point must clearly bring out the evidence for any score to be given																																							
3(a)	Two types of igneous rocks	Extrusive Intrusive	Students should stick to types not examples																																							
3(b)	Three uses of rocks	<p>Pumice is used for bathing</p> <p>Marble is used for house decorations</p> <p>Coal is use heating in industrial processes</p> <p>Basalts is mixed with tar for tarmacking roads</p> <p>Obsidian granite rocks are used for sculpturing</p> <p>Limestone rocks are raw materials for production of cement</p> <p>Hard rough rocks like diorite are used for sharpening knives</p>	The candidate must identify the rock and state its specific use General answers are highly discouraged																																							
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td></td> <td>J</td> <td>F</td> <td>M</td> <td>A</td> <td>M</td> <td>J</td> <td>J</td> <td>A</td> <td>S</td> <td>O</td> <td>N</td> <td>D</td> </tr> <tr> <td>tem</td> <td>21</td> <td>21</td> <td>20</td> <td>18</td> <td>15</td> <td>14</td> <td>13</td> <td>13</td> <td>15</td> <td>16</td> <td>18</td> <td>20</td> </tr> <tr> <td>rainfall</td> <td>24</td> <td>25</td> <td>30</td> <td>74</td> <td>17</td> <td>143</td> <td>131</td> <td>126</td> <td>70</td> <td>55</td> <td>31</td> <td>27</td> </tr> </table>			J	F	M	A	M	J	J	A	S	O	N	D	tem	21	21	20	18	15	14	13	13	15	16	18	20	rainfall	24	25	30	74	17	143	131	126	70	55	31	27	Mean annual range of temperature (Highest temp- lowest temp) recorded in the year $21^{\circ}\text{C} - 13^{\circ}\text{C} = 8^{\circ}\text{C}$	Units is vital to earn a mark
	J	F	M	A	M	J	J	A	S	O	N	D																														
tem	21	21	20	18	15	14	13	13	15	16	18	20																														
rainfall	24	25	30	74	17	143	131	126	70	55	31	27																														
4(i)	Rainfall totals for Y	$24+25+30+74+17+143+131+126+70+55+31+27$ $=753\text{mm of rainfall}$																																								

4(ii)	Climatic conditions experienced in hot deserts	<p>Mean annual temperature of about 30⁰c</p> <p>Large diurnal temperature range of about 20⁰c and more on cold nights</p> <p>High annual temperature range of about 26⁰c</p> <p>Skies are always cloudless and clear</p> <p>Rainfall below 250mm per year</p> <p>Rainfall is unreliable and sporadic</p> <p>Low humidity throughout the year</p> <p>Winds are warm and dry</p>	
5	Difference between ocean and sea	<p>Extensive or massive body of saline water occupying basin between continents while the sea is extensive body of saline water occupying margins of continents</p>	
5b		<p>E-BLOW HOLE/GOULP</p> <p>G- COASTAL CLIFF</p> <p>F – CAVE</p>	
SECTION B MAPWORK			
6(a) i	Convert scale of the map into statement scale	<p>Scale of the map1: 50000</p> <p style="padding-left: 40px;">1cm : 50000cm</p> <p style="padding-left: 40px;">1cm : 500m</p> <p>1cm : 0.5km</p> <p>1cm on paper represents 0.5 km on the ground</p>	Never use equal signs during calculations
6(ii)	Bearing of the bump house at grid square 3893 from trigonometrical station at Mweri	300o	Exact no deviation since two points are at pin points

6(iii)	The area part of forest east of eastings 40 and south of northings 97	Incomplete squares $20 \times \frac{20}{2} = 10km^2$ Complete squares $15 \times 15 = 15km^2$ 25km ²	Total area
6b(i)	Apart from forest give three types of natural vegetation found in the area covered by the map	Scrub vegetation (2990) Thicket vegetation (3390) Bamboo vegetation (3901) Woodland vegetation (3300) Scattered trees vegetation (3600)	
6b(ii)	River drainage patterns in the area covered by the map	Dendritic drainage pattern on river Gatamayu Radial drainage pattern around kijabe hill Rivers Gatamayu, nduriri, nyanduma, kiruiru form parallel drainage pattern Intermittent Rivers southern slopes of kijabe hill form parallel drainage	The learner must identify the pattern in the map
6(c)	Cross section		



6c(ii)

Calculate vertical exaggeration

VERTICAL SCALE $V.E = \frac{\text{Vertical Scale}}{\text{Horizontal Scale}}$

HORIZONTAL SCALE

$$V.E = \frac{1:100M}{1:50000CM}$$

Conversion to similar units a must

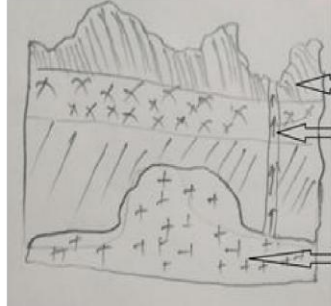
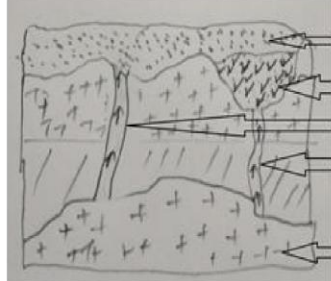
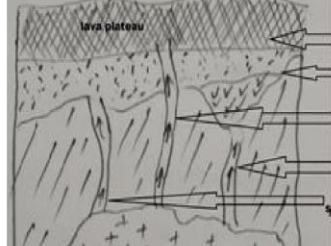
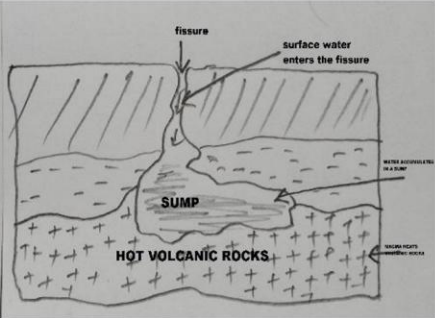
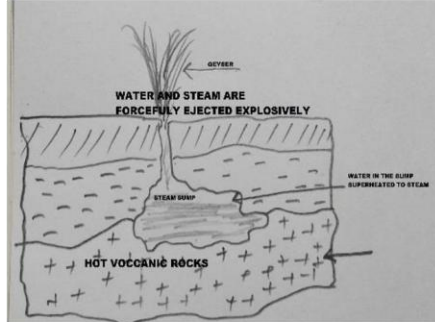
$$V.E = \frac{1:10000cm}{1:50000cm}$$

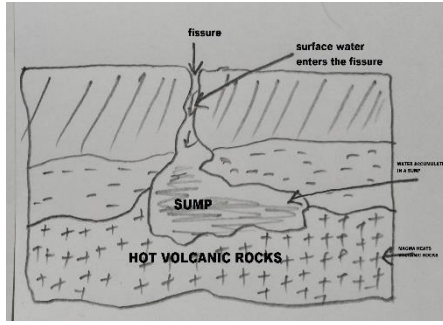
$$V.E = \frac{1}{\frac{1}{10000}} \gg \frac{1}{\frac{1}{50000}} > \frac{1}{10000} \div \frac{1}{50000}$$

$$\frac{1}{10000} \times \frac{50000}{1}$$

5times

6d	Citing evidence identify economic activities	Quarrying -murrum pit 3190 Dairy farming/milk processing – dairy3092 Animal faming -cattle dip Transportation- road/ railway line Trading -shops Saw milling- saw mill Forest farming-forest guard/forest station Water supply- pump house Communication -post office/telephone 3097 Manufacturing -kagwe carbacid plants Tourism -hot springs /escarpment Carbon dioxide extraction -carbacid plant	
7(a)	Define vulcanicity	It's the forceful crustal intrusion of molten magma, fumes and solid materials from the mantle into the crustal layers or ejected to the surface	
7(a)i	Life cycles of a volcano	Active volcano Dormant volcano Extinct volcano	
7(b) i	Describe how the following volcanic features are formed		
(i)	Lava plateau for those who used diagram	TEXT ONLY	

 <p>Labels: general land scape, fissure or crack, magma chamber under pressure</p>	<p>Lava plateau is a fissure eruption feature that forms on either a flat landscape or rugged landscape. Magma under high pressure forces its way through the crustal layers creating a fissure as shown</p>	<p>Student must clearing bring out the difference between lava and magma Procedure must be followed</p>
 <p>Labels: solidified lava, first extrusion lava layer, second layer opens up, fissure blocked by solid magma, magma chamber</p>	<p>Through this fissure magma reaches the earth surface creating lava this lava spreads and covers, solidifying on the surface blocking the first fissure, causing the second fissure to open through the first layer</p>	<p>Its purely fissure eruption not vent</p>
 <p>Labels: lava plateau, solidified lava form third fissure, solidified lava form first fissure, third fissure opens, first fissure blocked, second fissure blocked by lava</p>	<p>When pressure subsides the second vent blocks making pressure to increase forcing open the third fissure through which lave oozes out spreading on the landscape creating flat table-like feature called lava plateau</p>	
<p>7(ii)</p>	<p>Geyser diagram</p>	<p>TEXT PRESENTATION</p>
 <p>Labels: fissure, surface water enters the fissure, WATER PERCOLATES IN A SUMP, SUMP, HOT VOLCANIC ROCKS, WATER HEATS UP</p> <p>stage 1</p>	<p>A geyser starts to for when water percolates fissures on the crustal surface into a underground pre-existing sump, settling on hot volcanic rocks boiling it</p>	
 <p>Labels: GEYSER, WATER AND STEAM ARE FORCEFULLY EJECTED EXPLOSIVELY, STEAM SUMP, WATER IN THE SUMP SUPERHEATED TO STEAM, HOT VOLCANIC ROCKS</p> <p>Stage 2</p>	<p>Continuous percolation of water into a sump fills it completely, blocking the fissure. The water in the sump boils and turns into superheated steam increasing sump pressure that is explosively ejected through the fissure one or two meters above the ground called a geyser</p>	



Stage 3

After ejection sump pressure reduces, ejected cooled water flows back into the sump its boil again
This process repeats itself at regular intervals as long as there is sufficient water circulation into and out of the sump

7(iii)

Caldera formation

Version 1

Violent volcanic eruption

Earth movements forms a vent in rocks of the crust
Magma erupts through the vent to form volcanic cone with crater at on top
Magma solidifies and forms a plug that seals the vent
Over long-time steam and other gases build up pressure below the plug
Pressure piles below the plug leading to vent eruption
The violent eruption blows of the top or head of volcanic cone or crater top This create deep wide steep sided depression on top of the volcanic cone called Caldera

Version 2

Formation by block subsidence

Earth movement forms the vent in the rocks of the crust
Magma is forced out through the vent to form volcanic cone with crater at the top
When pressure below subsides, a hollow cavity called cauldron is formed in the magma reservoir beneath the volcanic cone
Rocks in contact with magma below are melted increasing the size of the cauldron
The weight of the volcano creates pressure that results in cracks making the mountain unstable making the materials overlying the cauldron to fall through the vent into the cauldron This forms a wide steep sided circular depression called cauldron caldera or caldera

Version 3

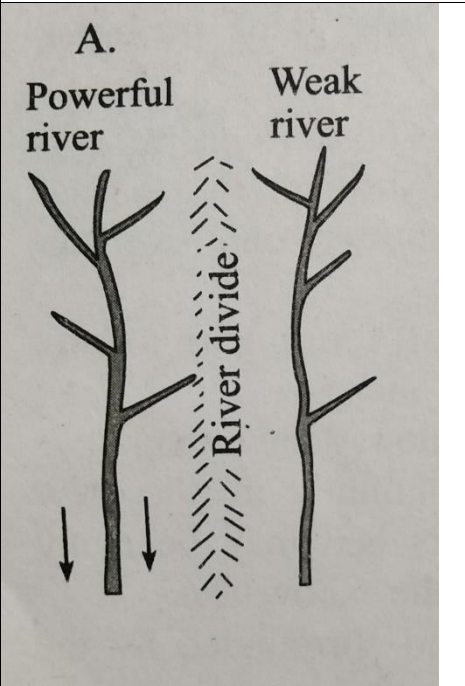
	By outward collapsing	<p>Volcanic eruption of ash, cinder/and pyroclasts through the vent forms volcanic cone</p> <p>After several eruptions a high steep and unstable ash and pyroclastic volcano is formed</p> <p>Weight of the upper materials exert materials beneath causing instability of lower parts</p> <p>The materials on the base start to spread outwards widening the base The top of volcano collapses inward forming wider depression called a caldera</p>	
7c	Four positive ways in which volcanic features influence human activities	<p>Volcanic fumaroles moffettes and solfatara have always been harnessed to produce valuable gases for required in the industrial manufacture</p> <p>During magma intrusion metamorphic aureole is formed, this zone has valuable minerals like gold, diamonds this has triggered mining</p> <p>Regions with hot underground volcanic rocks form geysers, and steam jets that is tapped to generate geothermal power</p> <p>High volcanic mountains that are snow covered often creates unique sceneries that attract tourists promoting tourism</p> <p>Volcanic crater lakes in some places are rich grounds for fish this promotes fishing</p> <p>Volcanic tors are source of hard rocks often used in building and engineering</p> <p>High Volcanic mountains creates orographic rainfall</p>	
8a(i)	Vegetation marked	<p>H- The prairies</p> <p>J - The tundra vegetation</p> <p>K- The desert vegetation</p>	

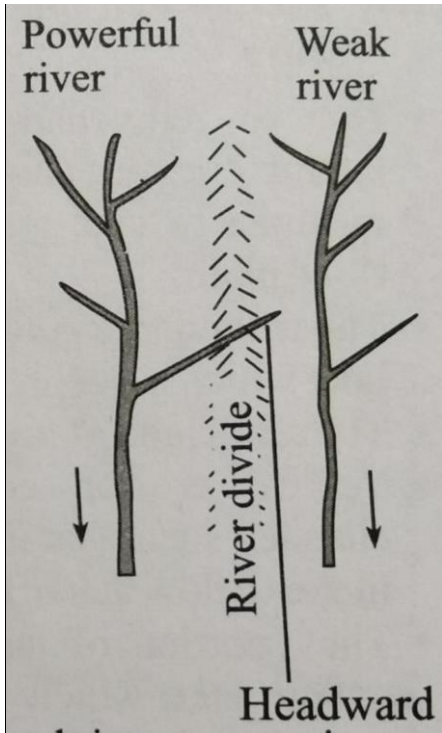
8a(ii)	Characteristic of vegetation marked L	<p>L is tropical rainforest/ selvas /equatorial rainforest Vegetation</p> <p>They have three distinct canopies Limited or no underground Trees take long to mature Trees have large trunks with buttress roots for support Tree have broad leaves Mixed species of trees over small area Majority of trees are tall have smooth stems and straight trunks Most trees are evergreen Forest is mainly made of hardwoods Vegetation grows together</p>	
8b i)	<p>Explain how each of the following vegetation distribution</p> <p>Rainfall</p>	<p>Areas receiving high rainfall are forested with large variety of tree species Areas with moderate rainfall have woodland, scattered trees and grass Areas with low rainfall have scrub vegetation mainly thorny bushes and short grass</p>	
ii)	Soils	<p>Fertile and deep soils support they growth of dense vegetation as they have variety of well-balanced nutrients Thin and infertile soils support poorly developed and scanty vegetation cover as they have insufficient nutrients. Poorly drained, coarse or fine textured soils support scanty or no vegetation. Only few plants grow well in acidic soils Very few plant species grow in extremely saline soils Deep rooted trees are only found in deep soil profiles shallow rooted vegetation are only found in shallow soils</p>	

8c	Five uses of savanna vegetation	<p>Most savanna grasslands are reserves and game parks for wildlife</p> <p>Some tree species are harnessed for medicinal value</p> <p>Tree trunks and grasses are used for constructing houses for domestic use and tourists</p> <p>Some trees like guavas and some roots are tapped for food</p> <p>Savanna vegetation sometimes is left undisturbed to control soil erosion mitigate climate change Savanna vegetation is beautiful therefore used as aesthetic beauty Stems are harnessed for firewood Huge trunks are sources of valuable timber and poles</p> <p>Vegetation decomposes to form humus which enriches the soil</p>	
8d(i)			
	Three objectives I would formulate for the field study	<p>To find out the types of vegetation at different heights</p> <p>To identify characteristics of the vegetation</p> <p>To find out species of plants in the area</p> <p>To identify factors influencing vegetation distribution in the area</p> <p>To establish economic uses of vegetation</p>	

		To determine main causes of vegetation destruction Identify methods that can be used to conserve the vegetation	
8d(ii)	Why working schedule is important	Gives ample time for each activity so that none is forgotten Reduced the tendency to waste time and forces the research team to work within allocated time of the project Provides estimate of time required for field study Provides basis for evaluating field work still in progress Maintains the scope of field work	
9(a) i)	Apart from biological weathering list two other types of weathering	Physical weathering Chemical weathering	
9a(ii)	Explain ways in which plants cause weathering of rocks	Decaying plants release humic acid that reacts with rocks breaking them Trees roots within cracks of rocks expand in them enlarging cracks that eventually breaks them. Plants like algae fungi mosses and lichens extract nutrients in form of ions breaking the rock in the process called chelation	
9b	How the following factors influence Mass wasting		
(i)	Earth movement	Earth movements provides energy that triggers downslope movement of materials Shaking of the crustal layers shakes the soaked ground making upper layers to slide on them It increases the power of downslope movement of materials It increases the surface area, points or magnitude of how and where mass wasting can occur at a time.	
ii)	Nature of rock materials	Rocks with rough surfaces resist downward motion due to friction this slows down mass wasting Heavy rocks tend to move downslope faster than light rocks Shape of rocks, rocks that have round shape tend to roll down the slope while those with irregular shaper slide along the surface slowly Small sandy like rocks provide avenue for rolling down the slope for big flat rocks this fastens mass wasting	

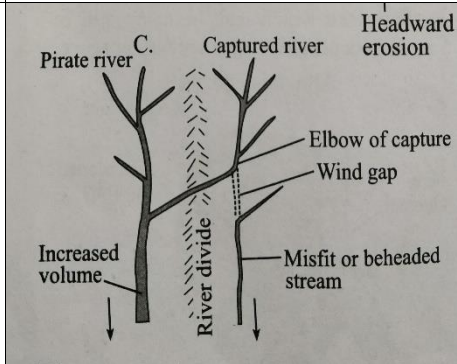
9c	Describe each of the following process of mass wasting		
i)	avalanche	Sudden rise in temperature on glaciated mountains or highlands in temperate regions causes sudden melting within the ice covering the mountains Large block of ice cuts with frozen rock cuts off the mountain slope sliding down the steep glaciated mountain slope as one large mass. Avalanche can also be triggered by an earthquake, mountain human actions or sport	
ii)	Rock fall	Occurs on steep slopes with well jointed rocks where individual rock fragments are detached from steep slopes, and fall vertically down the steep face of the slope Earthquake, violent volcanic eruptions, explosives during mining can also trigger rock fall	
9d	Describe each of the following types of mass wasting		
i)	Earth flow	Earth flow occurs on moderate steep slopes covered with soil and weathered rock particles During heavy or high rainfall, the soil or weathered material absorb a lot of water become heavy and saturated with water break away from the slope These saturated materials move downslope unnoticed until after some days	
ii)	Slump	Involves slipping down of weak rock materials down very steep slope Independent units of rock materials slip down making backward rotation to form a curved slip plane of the slope	
10	Features on the upper stage of the river	Interlocking spurs Truncated spurs Water fall Narrow v shaped valleys Potholes on the river channel Rapids Canyons Plunge pool	
	State four factors that favour formation of braided channels	Rivers carrying a large load of alluvium which is deposited on the riverbed Reduced gradient and low speed Reduction of water during volume or discharge during rainy dry season High evaporation rate that reduces water volume in arid areas Presence of obstacles on the river bed	

	<p>Process by which river transports its load</p>	<p>Solution, soluble rocks and minerals dissolve in water and transported down stream Suspension fine and light materials are carried and held within water</p>	
		<p>currents while insoluble one's float on the surface Saltation medium heavy particles such as pebbles are lifted from the bed and then dropped after short distance by water currents, in short jumps and hops Traction heavy rocks large boulders are rolled along the river bed for short distance at a time especially when the river is high in competence</p>	
	<p>With aid of well labelled diagrams describe how a river capture occurs</p>		
	<p>A.</p>  <p>stage 1</p>	<p>Two adjacent rivers flow parallel downslope One river has more erosive power than the other</p>	



stage 2

The more powerful river erodes vertically and headwardly more than the weaker river, across the divide, with powerful tributary extending toward the weaker stream



stage 3

The pirate river eventually joins the valley of neighbouring stream diverting the waters of weaker stream into the pirate river, this river is said to have been beheaded or pirated or captured

10 d

Negative effect of rivers to human environment

Rivers flooding may lead to loss of life displacement of people and destruction of property
 Wide and deep rivers make it difficult and expensive to construct bridges roads and railways
 Rivers can be medium for spreading diseases as flood waters may spread chemicals and human waste
 Some rivers are habitat to dangerous wild animals which attack people and destroy crops like the hippos