312/1 MS
GEOGRAPHY
Paper 1
MARKING SCHEME
March 2021

THE KENYA NATIONAL EXAMINATIONS COUNCIL

KENYA CERTIFICATE OF SECONDARY EDUCATION

GEOGRAPHY

Paper 1

MARKING SCHEME
(CONFIDENTIAL)

This marking scheme consists of 20 printed pages.

MARKING SCHEME

SECTION A

1. (a)	**Define the term environment.** - Environment is the external conditions that surround an organism/external conditions that influence the development and behaviour of an organism.	(2 marks)
(b)	**Name three divisions of physical Geography.** - Climatology - Biogeography - Geomorphology - ~~Earth and the solar system~~	Any 3 x 1 = ~~(3 marks)~~
2. (a)	**Give three characteristics of comets.** - They are made up of frozen gases/ dust ~~and small~~ rocky particles. - They have a head and tail. - They move along oval-shaped orbit. - ~~The sun is located at one end of their orbit.~~ - They cross orbits followed by the planets.	~~Any 3 x 1 = (3 marks)~~ 3
(b)	**State three proofs that show the shape of the earth is spherical.** - Circumnavigation along a straight path leads one to the starting point from the opposite direction. - Photographs taken from satellite clearly show the earth is spherical. - The gradual emergence of a ship approaching the shore. - During lunar eclipse spherical shaped shadow of the earth is cast on the moon. - The earth is a planet and all planets are spheres. - The different times during which the sun rises and sets in different parts of the world. - The earth's horizon appears circular/curved when viewed from a very high point.	~~Any 3 x 1 = (3 marks)~~ 3
3. (a)	**Give two types of igneous rocks.** - Intrusive igneous rocks. - Extrusive igneous rocks.	~~(2~~ 2 marks)
(b)	**Identify three uses of rocks.** - Rocks weather down to form soils which support agriculture.	

- Some rocks are used for scrubbing human bodies
- Some rocks store water for use
- Some rocks form fossil fuels
- Some rocks are used for sharpening tools.

	- Some rock features are tourist attraction. - Rocks provide materials for building/construction. - Some rocks provide raw materials for manufacturing industry. - Some rocks are source of minerals. - Some rocks are used in carving. - Some rocks are source of salt. ✓ food Any 3x1 3	~~Any 3 x 1 =~~ ~~(3 marks)~~ 3
4.	**The table below shows the rainfall and temperature data for town Y. Use it to answer question (5)** 1 **(a)**	

Month	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Temperature (°C)	21	21	20	18	15	14	13	13	15	16	18	20
Rainfall (mm)	24	25	30	74	17	143	131	126	70	55	31	27

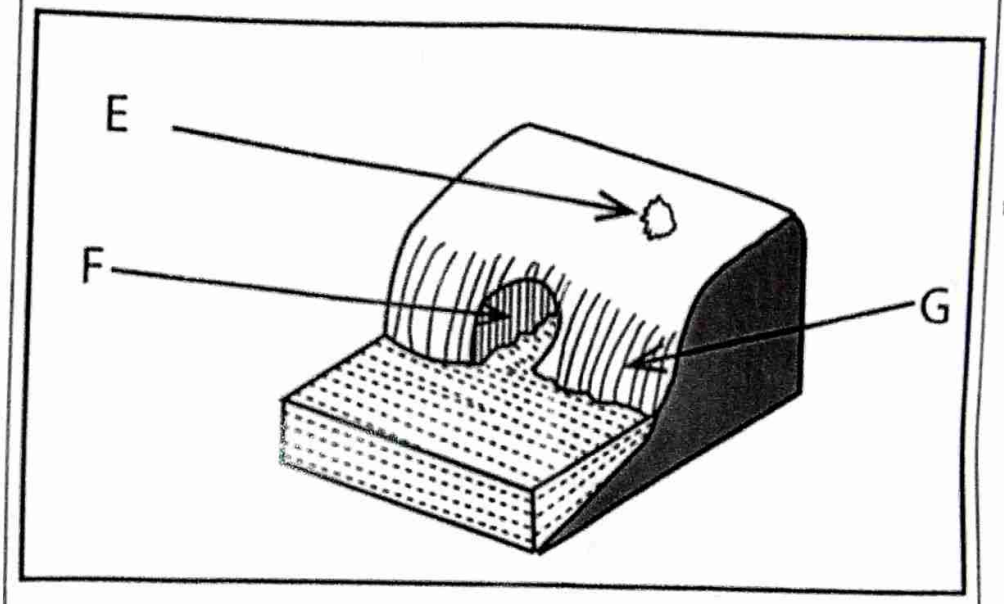
(a) (i) What is the mean annual range of temperature? $(21 - 13) = 8°C$ ✓ / $\frac{204}{12} = 17°C$ * Based on the mistake in the question 1 (ii) Calculate the rainfall totals for town Y. 753mm ✓ 1 **(b) State three climatic conditions experienced in the hot deserts.** - Low rainfall/below 250mm per year. ✓ - Rare/erratic rainfall - High temperatures throughout the year/over 35°C - The diurnal range of temperatures is very large/hot days and cool nights. - Low humidity/below 45% - The skies are cloudless/clear - There are strong dusty winds/sand storms/dry winds 3 Any 3x1	~~(1 mark)~~ 2 ~~Any 3 x 1 =~~ ~~(3 marks)~~ 3 (5)
5. (a)	**Differentiate between ocean and sea.** - An ocean is a large/extensive body of saline water occupying a basin between continents, while a sea is a large body of saline water along the continental margins. ✓ 2	~~(2 marks)~~

(b) **The diagram below shows some coastal features. Name the features marked E, F and G.**

E – Blow-hole / Gloup

F – Cave

G – Cliff



~~(3 marks)~~

3 3

(5)

25

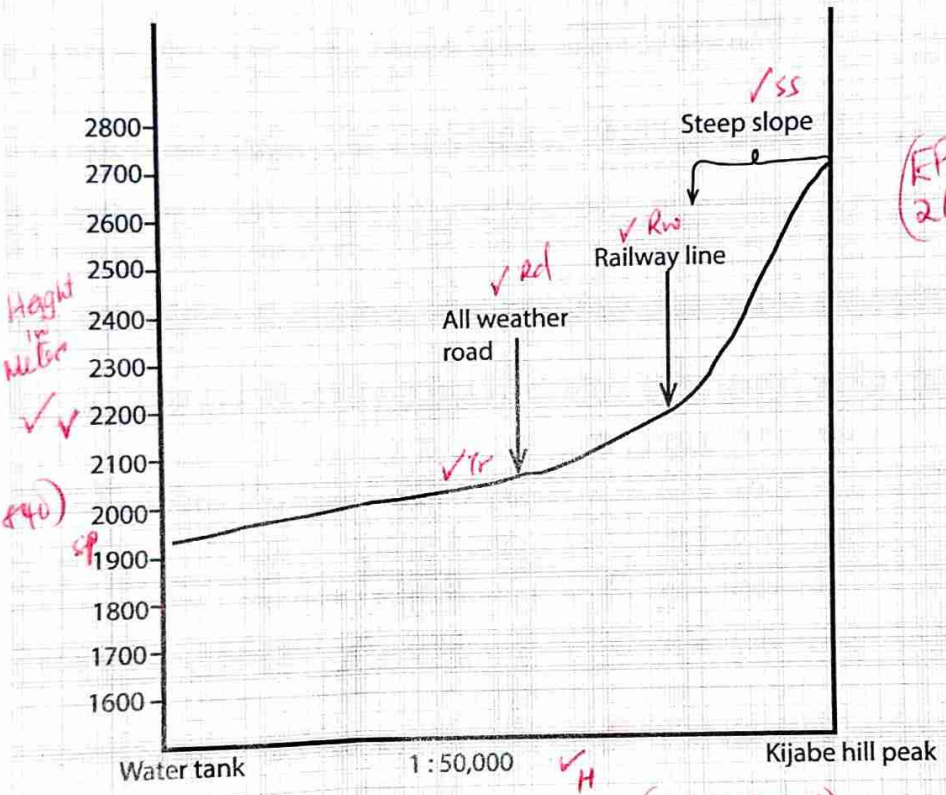
SECTION B

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

6. (a)	**Study the map of Kijabe 1:50,000 (Sheet 134/3) Provided and answer the following questions.**	
(i)	Convert the scale of the map into a statement scale. Map scale: 1:50,000 1cm rep 50,000 $5000\text{cm} = \frac{50000\text{km}}{100000}$ $= 0.5\text{km}$ Statement scale is 1cm represents 0.5½km 2	(2 marks)
(ii)	**What is the bearing of the pump house at grid square 3893 from the trigonometrical station at Mweri.** 300°±1° 299° – 301° / N60°W ±1° (N59°W – N61°W) 2	(2 marks)
(iii)	**Calculate the area of the part of the forest to the East of Easting 40 and South of Northing 97. Give your answer in square kilometres.** Full squares = 17 15 ½ square 18/2 = 9 20/2 = 10 26 25 ± 1 = 26 ± 0.5km² (24 – 26 km²) 2	6 (2 marks)
(b) (i)	**Apart from forest give three types of natural vegetation found in the area covered by the map.** - Thicket - Woodland - Scrub - Bamboo - Scattered trees. Any 3 + 1 3	Any 3 x 1 = (3 marks

(ii)	**Identify three drainage patterns found in the area covered by the map.** - Radial drainage pattern. - Dendritic drainage pattern. - Parallel drainage pattern.	6 ~~(3 marks)~~
(c) (i)	**Using a vertical scale 1cm to represent 100 metres, draw a cross section from the water tank on grid square 2592 to the peak of Kijabe Hill on grid square 2699.** On it, mark and label the following: - All weather road bound surface. - Railway line. - Steep slope.	(4 marks) (3 marks)

A cross section from water tank in grid 2592 to peak of Kijabe hill



7

(ii) **Calculate the vertical exaggeration of the cross section.**

$$VE = \frac{VS}{HS} = \frac{1:100m}{1:50,000cm}$$

$$= \frac{1:10000}{1:50,000} = 1 \times 5$$

= 5 times

2 9 ~~(2 marks)~~

(d) **Citing evidence from the map identity two economic activities in the area covered by the map.**

Economic activity	Evidence
- Transportation	- Roads/railway
- Forestry	- Line/motorable track.
- Trade	- shops
- Communication	- Post office
- Quarrying	- Murram pit/quarry
- Lumbering	- Saw mills
- Cattle rearing/keeping	- Cattle dip/~~dairy~~
- Dairy farming	- Dairy
- Manufacturing/processing	- Kagwe carbacid plant
- Crop farming	- Plantation

Any 2 x 2 =

~~(4 marks)~~

4 ~~(25)~~

7. (a) (i) **Define the term vulcanicity.**

Vulcanicity is the process through which liquid, solid or gaseous materials ~~find their way~~ are forced into the earth ~~surface~~ crust or onto the surface of the earth, due to high pressure and temperature.

2 ~~(2 marks)~~

(ii) **Name the three stages in the life cycle of a volcano**

- Active
- Dormant
- Extinct

3 5 ~~(3 marks)~~

(b) **Describe how the following volcanic features are formed.**

Lava plateau

(i)	- It is formed when magma reaches the earth surface through ~~either single or~~ multiple vents/fissures. - The lava is ultra-basic/extremely fluid. - The lava flows over ~~large~~ long distances spreading evenly ~~before~~ covering hills and depressions cooling. - The lava cools slowly, and solidifies - Successive eruptions lead to more and more layers building up ~~forming a lava plateau.~~ thick plain like table land called Lava Plateau. (6 max 4) 4	~~Any 4 x 1 = 4 marks~~
(ii)	**Geyser** - Water percolates underground through cracks in the rock. - The water gets into contact with hot igneous rocks. - The water is superheated to form gases/~~vapour.~~ steam. - Pressure builds up - The pressure forces the steam and water to be ejected to the surface. - The water and steam is ~~emptied~~ emitted intermittently as pressure level changes to form a geyser. (7 max 4) 4	~~Any 4 x 1 = 4 marks~~
(iii)	**Caldera** - Lava ~~pouring~~ pours out of a central vent to form a volcanic cone. - The vent ~~may be~~ is sealed when lava solidifies in it. - The solidified lava blocks the gases and steam beneath, preventing them from escaping. - Pressure piles up below the lava. - The pressure leads to violent eruption which blows off the top of the cone forming a depression. - The depression is large and circular and it is known as a caldera/.OR - Lava pours out of a central vent to form a volcanic cone	

This point must be mentioned to score max 4 marks

This point must be mentioned to score a maximum 4 marks

Explosion theory by Bond

Must be mentioned to score a max 4

Subsidence by Collapse theory Cauldron

- Magma Chambers are left empty ✓/void/cauldron

	- Due to the overlying weight at the top of the cone, ~~an~~ Pressure is exerted ✓ ~~imbalance is created~~. - The top of the cone subsides ✓/sinks forming a depression - This depression is large ✓ and circular and is called a caldera ✓	Any 4 x 1 = 4 marks

(The point must be mentioned to secure a maximum of 4 marks)

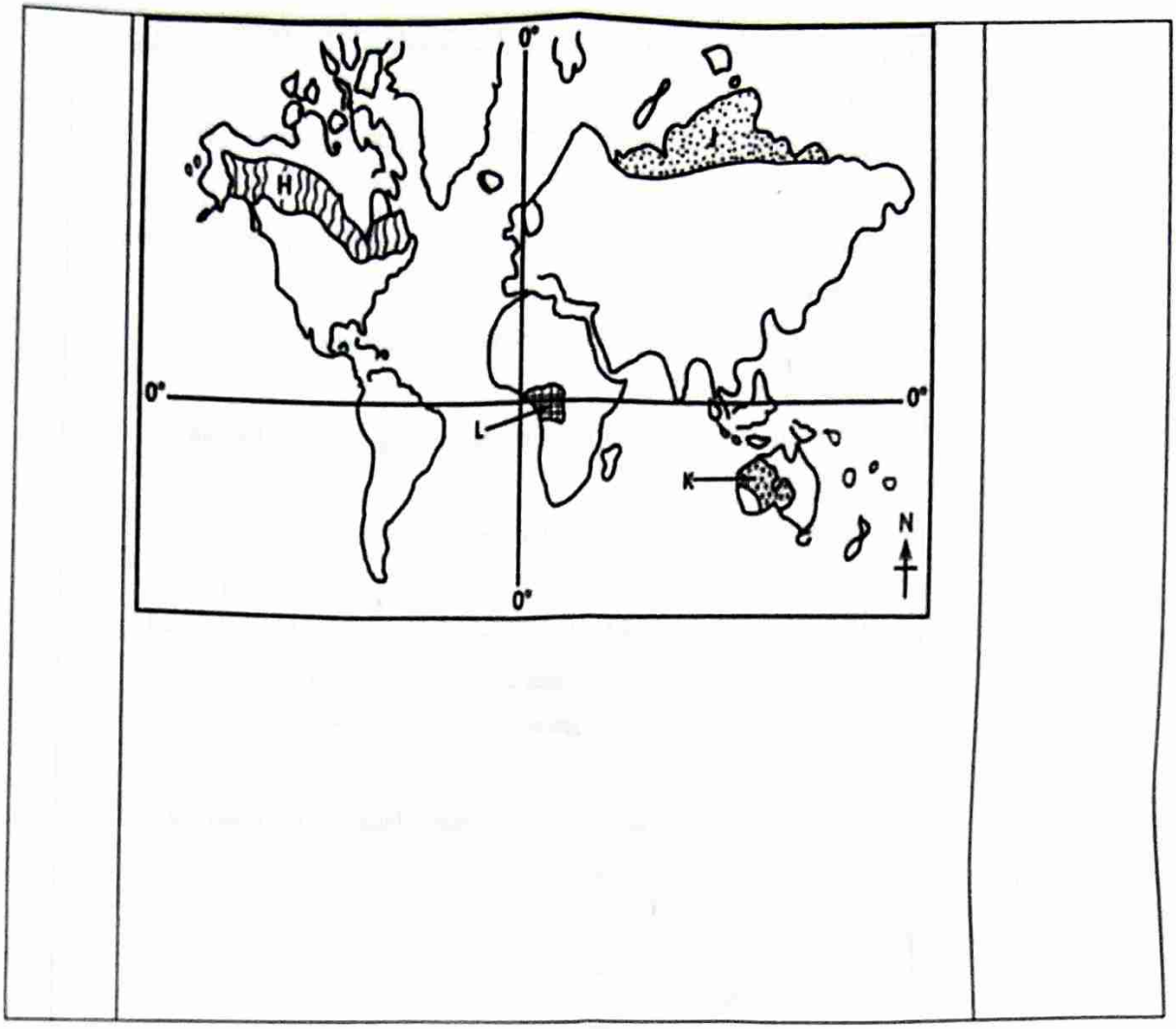
- A volcano is build of ash & Pyriclasts to form a dome ✓
- The weak materials at the base are unable to support the overlying Materials ✓/ Weight
- The materials at the base spread outwards as the top part of the volcano sinks ✓/ subsides.
- This will lead to a large ✓ depression called a Caldera ✓.

Outward collapse Theory

(Must be mentioned to secure a maximum of 4 marks)

Remarks 4 | 12

(c)	**Explain four positive ways in which volcanic features influence human activities.** - Volcanic lava upon weathering forms fertile soils which are used in agricultural activity. - Some volcanic plugs have valuable minerals which are ~~useful to human beings.~~ - ~~Geysers~~ are used in harnessing geothermal electricity for domestic/industrial use. - Some volcanic features attracts tourists earning a country foreign exchange. - Volcanic mountains influence the formation of relief rainfall on their slopes which encourages agricultural activities/settlement. - Volcanic lakes are used for fishing which is a source of income/food. - Some lakes are a source of water for domestic/industrial use. - ~~Volcanic mountains have forests which provide timber for building/construction.~~ - Volcanic mountains are a source of rivers which provide water for domestic/industrial/irrigation. - Hotsprings/spas are used for medicinal purposes - Some volcanic rocks are used as building materials. Any 4 x 2 8	~~Any 4 x 2 = 8 marks~~ 8
8.	**The map below shows some vegetation regions of the world. Use it to answer question (a) (i) and (ii)**	25


0°
H
0°
0°
L
K
N
0°

(a) (i)	Name the vegetation marked H, J and K. H – Coniferous forest ✓ J – tundra ✓ K – Tropical desert ✓ 3	3 ~~marks~~
(ii)	**Describe the characteristics of the vegetation found in the area shaded and marked L.** - The trees grow close to each other/ closely packed. - The trees form canopies/ form three distinct layers/ emergents. - The trees have straights/smooth trunks. - Most of the trees species are hardwoods. - The trees are evergreen. - The trees have broad leaves/drip-tipped leaves. - The forests have little or no undergrowth. - Forests consist of a variety of tree species. - Some of the trees have buttress roots. - The trees are tall. - The forest has climbers/epiphytes. - Trees take long to mature Any 6 x 1 6	Any ~~6 x 1 = 6 marks~~ 9
(b) (i)	**Explain how the following factors influence distribution of vegetation.** **Rainfall** - Areas receiving high rainfall encourage growth of many varieties of tree species/ luxuriant vegetation/ forest - Areas receiving low rainfall have few species/ scanty ~~stunted~~ vegetation. - Areas of low rainfall have stunted vegetation Any 1x2 2	Any ~~1~~ x 2 ~~= 2 marks~~

(ii)	**Soils** - ~~Rich~~ Deep **and** well drained soils support growth of dense vegetation. - ~~Poor~~/infertile/shallow/ thin soils support scanty vegetation. Any 1x2 2	~~Any 1 x 2 = 2 marks~~ 4
(c)	**State five uses of savanna vegetation.** - The grassland area is used for livestock farming/grazing. - The vegetation provides habitat for wild animals. - Trees are used for bee keeping. - Some of the vegetation is used for medicinal purposes. - Some of the vegetation provides wild fruit ~~and berries~~. - Trees are a source of wood fuel. - Some of the vegetation provide building materials. - Grass forage decompose to form humus Any 5x1 5	~~Any 5 x 1 = 5 marks~~ 5
(d) (i)	**You intend to carry out a field study on vegetation within the local environment.** (i) State three objectives you would formulate for the study. -To identify vegetation species dominant in the area. -To find out how the local people benefit from the vegetation. -To investigate problems facing vegetation in the area. -To find out methods used to conserve vegetation in the area Any 3x1 3	~~Any 3 x 1 = 3 marks~~
(ii)	**Give four reasons why it is important to have a work schedule.** - It helps in carrying out the field activities systematically.	

must fit OS research topic

	- It helps in estimating the total time required for the study. - It ensures all areas of study are adequately covered. - It helps in assessing progress of the study. - It enables for proper use of available time. - It confines one to the scope of the study. Any 4x1 4	Any 4 x 1 = 4 marks
9.	**Apart from biological weathering list two other types of weathering**	
(a) (i)	- Mechanical/physical - Chemical 2	2 marks
(ii)	**Explain ways in which plants cause weathering of rocks.** - Roots of plants/trees penetrate into the joints/cracks of rocks widening them hence causing the rock to disintegrate. - Plants decompose/rot forming organic/humic acids which causes rock decay/disintegration. - Mosses and lichens moisten rock surfaces facilitating chemical weathering. - Widening of crack and joints by plants roots allows water and air to enter into the rocks hence accelerating weathering. Any 3x2 6	Any 3 x 2 = 6 marks
(b)	**Explain how the following physical factors influence mass wasting.**	
(i)	**Earth movements** - Volcanic eruptions/earthquakes cause tremors which may trigger displacement of materials/ wide spread mass wasting. 2	2 marks
(ii)	**Nature of rock material**	

- Loose/unconsolidated materials easily moves on slopes.

	- Large/heavy rock materials move rapidly on a slope due to gravity. Since they are overcome by gravity/thinly bedded layers tend to move faster on slopes. - Saturated rock materials move faster down a slope than any materials non-saturated materials. Any 1x2 2	~~Any 1 x 2 = 2 marks~~ 4
(c)	**Describe each of the following processes of mass**	
(i)	**wasting.**	
	Avalanche - ~~It is a sudden movement of a large mass of snow/ice with loose materials down slope due to gravitational pull.~~ - It occurs when a fresh fall of snow is not firmly consolidated hence slides over the older snow/ice rapidly. - The thawing action of ice lubricates weathered rock and large ice blocks making them slide downhill rapidly. ~~as an avalanche.~~ Any 1x2 2	~~Any 2 x 1 = 2 marks~~
(ii)	**Rockfall** - It involves free fall of detached rocks down a steep/vertical slope. - They may fall directly downwards or bounce and roll down the slope. - It may occur due to freeze-thaw process/loosening action of plant roots/heating & cooling/earth movement ~~and influence of gravitational pull.~~ - ~~The debris form cone shaped heap at the foot of the cliff/hill.~~ Any 3x1 3	5 ~~Any 3 x 1 = 3 marks~~
(d)	**Describe each of the following types of mass wasting.**	
(i)	**Earthflow** - It occurs in humid conditions. - Occurs on Moderate slopes. - Materials on the surface get saturated with water. - They flow/slide down the hill under the influence of gravity. - They leave behind shallow scars.	

	- They form small bench like terraces at their destination. Any 4x1 4	Any 4 x 1 = 4 marks
(ii)	**Slump** - It occurs on very steep slopes. Concave slopes. - A massive sedimentary strata overlying weak rock materials e.g. clay. - The underlying rock material is saturated with water. - This causes undercutting/breaking off of the overlying rock materials. - The large mass of rock and loose materials shear/tear away along the concave plane. - The rock material slides downhill causing a slump. Any 4x1 4	8 Any 5 x 1 = 5 marks
10. (a) (i)	**Give three features found in the upper stage of river.** - V-shaped valleys. - Potholes/plunge pools. - Interlocking spurs. - Waterfalls/rapids/cataracts. - Gorges/canyons. - Winding Channels. Any 3x1 3	25 Any 3 x 1 = 3 marks
(ii)	**State four factors that favour the formation of braided channels** - The river must be carrying a large load. - There should be reduction in the stream gradient. - There should be presence of obstacles. - There should be reduction of volume of water due to high evaporation/dry season. the river - The river flows at low velocity. - Widening of the River Channel. Any 4x1 4	Any 4 x 1 = 4 marks 7
(b)	**Explain the processes which a river transports it's load.**	

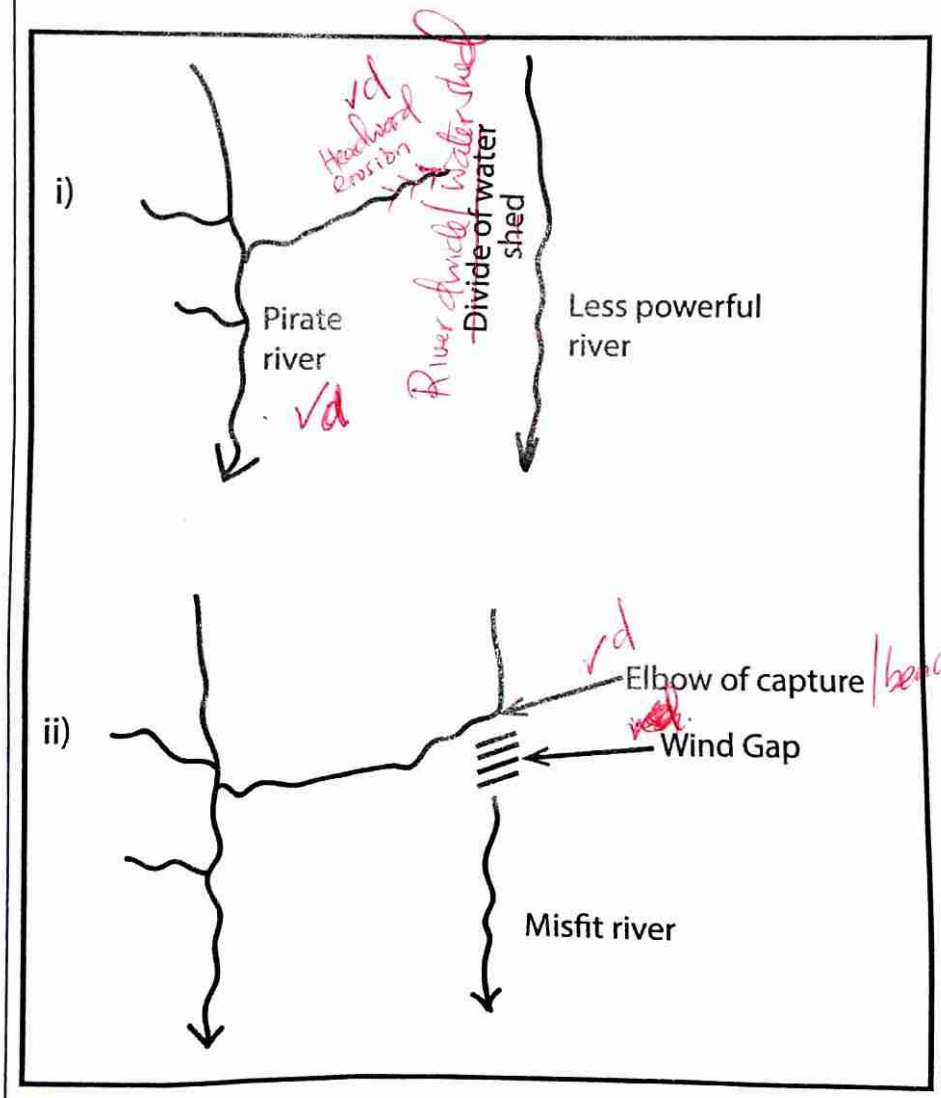
	- Light insoluble materials such as silt and sand are carried in suspension and maintained within the turbulence of the water. Some of them float on the surface of the water. - Large particles/boulders are pushed and rolled along the river bed by the force of gravity and moving water. This process is known as traction - Soluble materials are dissolved in the water and carried down the stream in form of solution. - Some particles/pebbles which are fairly heavy are moved in a series of leaps and hops along the river bed through a process known as saltation.	~~4 x 2 = 8 marks~~

* A Process can score on it's own but not the explanation

P-4
e-4

8 | 8

(c) **With the aid of well labelled diagrams describe how a river capture occurs.**



	- River capture may occur where there are two adjacent rivers/share a watershed. ✓t - One of the rivers has more erosive power than the other. ✓t - The more powerful river erodes ~~both~~ vertically ~~and laterally~~ faster than the weaker one thus it flows at a lower level than the other one. ✓t - The more powerful river erodes it's valley towards the valley of the other river. Through headward erosion ✓t - Eventually the powerful river joins the valley of the weaker river. ✓t - The powerful river diverts the head waters of the weaker river into it's channel. ✓t - The diversion of the headwaters is called River Capture	~~Any 4 x 1 = 4 marks~~ ~~Text – 4 marks~~ ~~Diagrams – 3 marks~~
(d)	**State three negative effects of rivers to human environment.** t-7 max 4 } 7 d-@3 - Some rivers with almost stagnant water harbor waterborne diseases, vectors - Some rivers flood during rainy seasons causing destruction of property and life. ✓ ✓ - Some rivers are home to dangerous animals which may attack human beings/destroy crops. ✓ - Rivers which are unnavigable hinder transportation. ✓ - River flooding causes displacement of people Any 3 x 1	7 ~~Any 3 x 1 = 3 marks~~ 3 | 3 25