

# PHYSICAL GEOGRAPHY

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## MARKING GUIDE 2014

### SECTION A (Answer all questions)

① Describe three effects of the revolution of the earth.

It causes change in four seasons.

It causes change in position of the mid day sun

It causes variation in the length of day and night

It causes leap years

It causes eclipse

It causes the beginning and ending of year.

It causes variation in temperatures

Any 3 described effects (3 marks).

② Gorges are one of the features that result from <sup>orcs</sup> water fall. State two factors that facilitated their formation in East Africa.

The nature (softness) of the rock

presence of a steep gradient

High volume of water

presence of the river in the upper stage

High speed/velocity of water

Tectonic movement e.g. faulting

Human activities

Erosion by glaciation

Any 2 stated factors (2 marks).

3) Name and explain the types of precipitate

- Fog
- Mist
- Haze
- Drizzles
- Rain clouds
- Rime
- Snow
- Frost
- Dew
- Rainfall
- Sleet

Any 4 named and explained types (4 marks)

4) Explain how living organisms and time influence soil formation

⇒ living organisms, like rodents and burrowing animals such as rats, termites, moles etc. influence soil erosion by digging holes

plants influence soil formation by using their roots

Bacteria also help in the decaying and decomposition of dead matter to form humus

Termites influence soil formation by churning

Vegetation leads to formation of rainfall which speeds up chemical weathering processes.

man's activities such as road construction, mining, farming etc

Animal and plant wastes also facilitate soil formation.

Heavy animals stepping on the ground also facilitate soil formation

⇒ Time influence soil formation in texture, hardness and depth depending on the time they have spent in existence.

~~Older~~ soil normally have enough time for their formation compared to young soils.

Pr  
Any two explanations one on living organisms and one on time (2 marks)  
Mark each

Rain: This is the large water droplets falling from the atmosphere ~~on~~ on the earth surface

Mizzle: This is the ~~tiny~~ tiny water droplets falling from the atmosphere to the earth surface

Hail stones: These are large pellets of ice falling on the ground.

Snow: These are small particles/crystals of ice falling on the earth surface

Dew: These are water droplets that form on objects near or at the earth surface usually at night

Sleet: It is a mixture of snow and rain.

Haze: This is characterised by fog influenced by dust and smoke particles reducing visibility to less than 2 kilometres.

Rime: These are tiny ice crystals formed when fog composed of super cooled droplets is driven by wind and deposited on objects like top of houses and trees.

visibility to ~~less~~ than one kilometre  
mist. This is the low clouds formed at  
or on the earth surface that reduced  
visibility extends ~~from~~ one to two  
kilometres.

Frost: this is a thin layer of ice which looks  
like powder and forms on surface of objects  
like bushes in extremely cold areas.

5) a) classify the following rocks according  
to their categories

Rocks	Igneous rock	Sedimentary rock	Metamorphic rock
Gneiss			✓
coal		✓	
coral		✓	
marble			✓
Granite	✓		

Amask each (5 marks)

b) State two problems of volcanic mountains  
to populations living near by

- loss of lives due to volcanic eruptions
- Displacement of people from their homes
- Destruction of people's property
- They hinder settlement
- They hinder transport and communication
- They cause soil erosion and landslides
- They harbour wild animals

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- They harbour rebels who cause insecurity
  - volcanic mountains are social barriers
  - They act as barriers for agricultural development and modernisation.
  - They are climatic barriers by creating rain shadow effects
  - volcanic eruptions cause pollution of air and associated diseases
- Any two stated problems (2 marks)

- 7) Explain four examples to explain the significance of features resulting from sea level changes
- Ria sand fiords are tourist attractions
  - Rias promote fishing
  - they are used for recreational purposes. e.g. Beaches
  - they are grounds for education and scientific research.
  - Raised cliffs help in the generation of hydro electric power.
  - they facilitate transport e.g. Rias
  - they facilitate development of ports
  - raised cliffs and raised beaches facilitate the construction of irrigation systems
  - promotion of sand mining
  - Some features like raised terraces and beaches are used for settlement

Any four significances associated with feature (4 marks)

7) Explain three factors that affect formation of river meanders.

- Nature of rock / rock hardness
  - presence of obstacles
  - Flat gradient
  - or Relief / topography of the area
  - volume of water
  - presence of alluvial deposits in the river's <sup>river's</sup> old stage; river damming
  - Earth movement such as faulting
- Any three explained factors (3 marks)

8) Describe how savanna vegetation has adapted itself to the physical environment in Rda.

- Trees ~~shed~~ off their leaves during the dry season to reduce evapo-transpiration.
- Trees are umbrella shaped to keep the ground moist.
- Trees have small leaves to limit transpiration.
- Some trees have small leaves to limit excessive <sup>over</sup> loss of water.
- Some trees have long tap roots to get water from deep layers.
- Trees have thorns to reduce the rate of transpiration and protection.
- Trees are scattered to avoid competition for water.
- Some trees have fibrous root to quickly use water on the surface before it evaporates.
- Trees are waxy to avoid excessive water loss.
- Some trees have swollen trunks to store water.

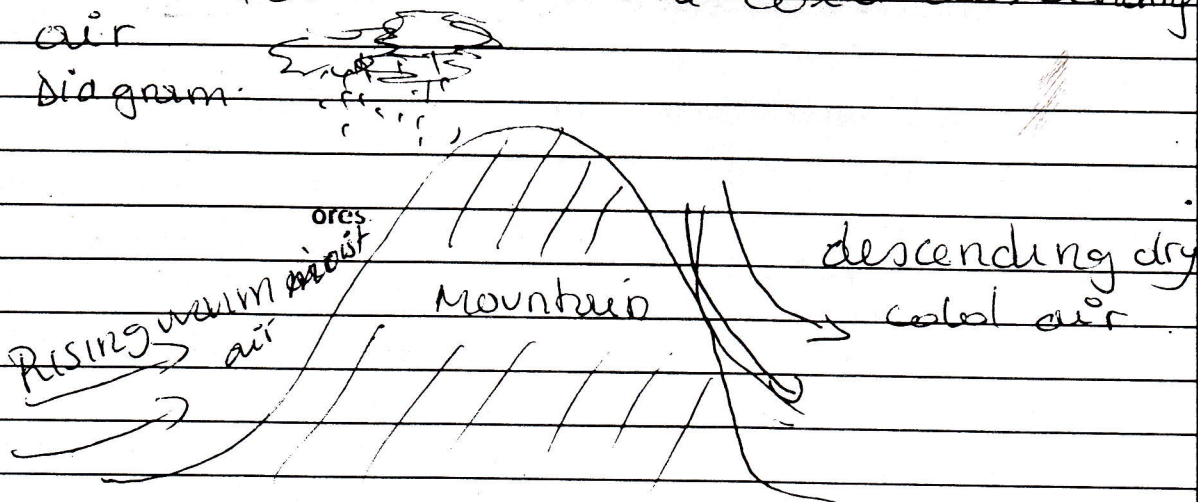
Savannah has short thickets that can survive in low rainfall areas. Seeds of these trees are fire resistant. Stems of trees in savanna are photosynthetic hence no need for leaves to carry out photosynthesis.

Any Four describe point (4 marks)

9. Briefly describe how relief rainfall is formed.

Relief rainfall is formed when moist blowing meets a mountain barrier. Wind is forced to rise/ascend reaching the condensation level where it cools, condenses and forms cloud which gives rainfall on the windward side leaving the leeward side with the cold descending air.

Diagram:



Explanation by words or well labelled diagram (2 marks).

10) Describe two uses of the geological time scale.

- It helps us to know when and how landforms were formed such as volcanoes and fold mountains.
- It is used to know the age of existence.

It is used to tell the period at which the rock was formed.

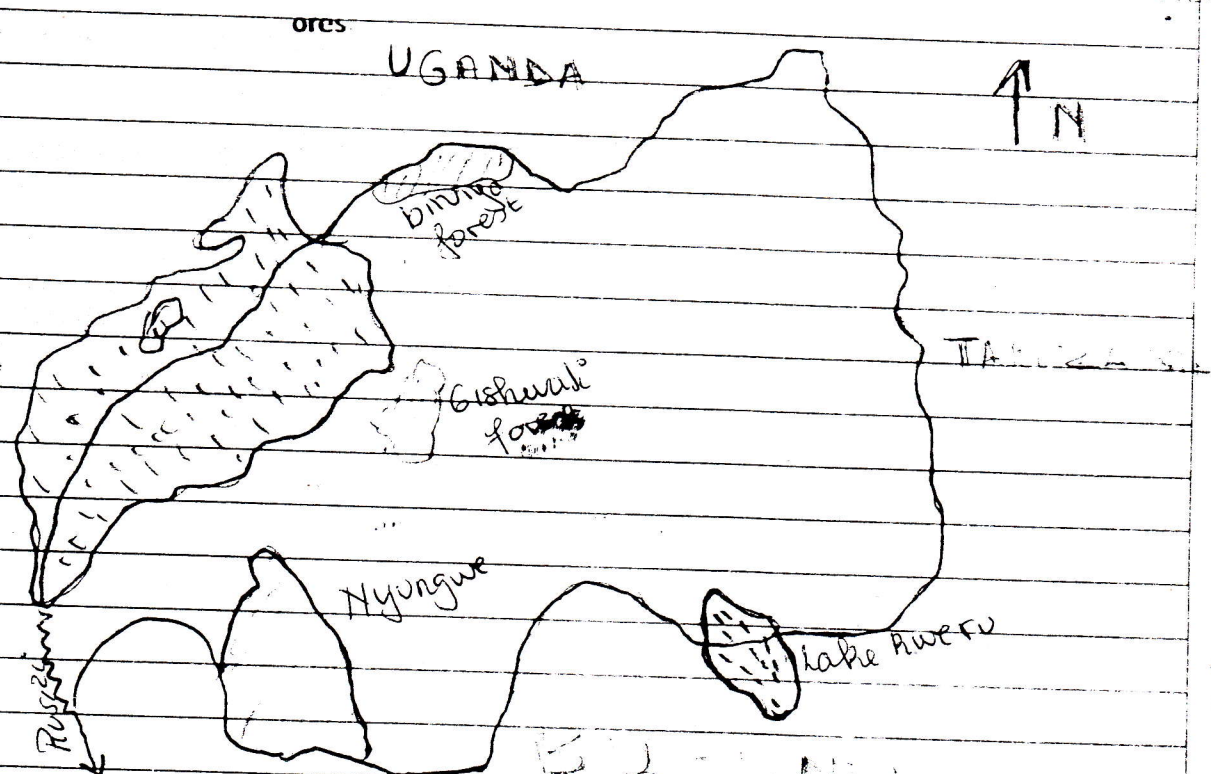
- It shows the life record which helps in understanding the relationship between living organisms (things) and geological processes or evolution.

- It helps us to predict occurrence of geographical phenomena e.g. earthquakes. It helps to understand the climatic conditions of an area basing on plants and animals.

Any two described points (2 marks)

- (11) a) Draw a sketch map of Rwanda and mark the following features:
- i) Nyungwe, Gishwati and Birunga forests.
  - ii) River Rusizi and Lake Rweru.

A sketch map of Rwanda showing major forests: Lake Rweru and Lake Rusizi.



well named and located features (5 marks)



The westerly wind blows over Congo forest and picks moisture hence causing rainfall in the western part of Uganda  
creation of variation in cloud cover.

If air masses are cold, they lower temperatures of such places

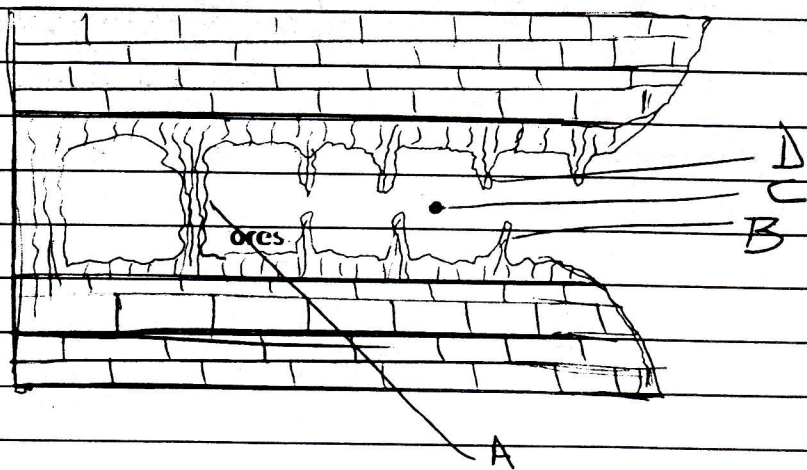
Air masses cause high humidity around lake victoria basin

They also increase temperatures of certain areas

They cause changes in the rate of evaporation  
They also cause low humidity during the summer season.

Any three well explained elements (6 marks).

13 The diagram below shows features that have resulted from carbonation processes. Name these features marked by letters A, B, C and D.



A = pillar / limestone pillar

B = Stalagmite

C = Cave / cavern

D = Stalactite

Any four well named features (4 marks)

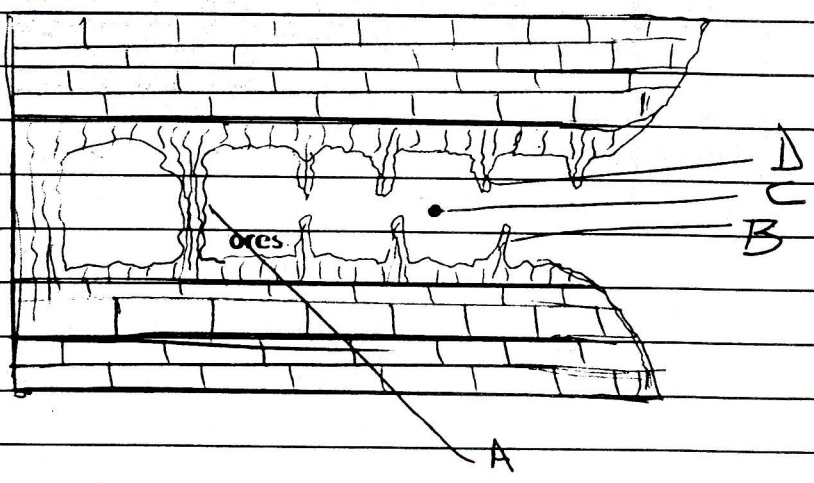
14 a. Define the term "warping"  
warping; is the general sinking and rising of the land surface due to lateral compressional forces.

10)

- The westerly wind blows over Congo forest and picks moisture hence causing rainfall in the western part of Uganda
- creation of variation in cloud cover.
- If air masses are cold, they lower temperature of such places
- Air masses cause high humidity around lake victoria basin
- They also increase temperature of certain areas
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Any three well explained elements (6 marks).

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Any four well named features (4 marks)

14) a. Define the term "warping"  
warping; is the general sinking and rising of the land surface due to lateral compressional forces.

10)

b. Explain the impact of a complete change in drainage patterns of Rwanda.

- It caused change of the direction of rivers known as river reversal (e.g. Akagera)
- Formation of lakes such as Muhazi
- It led to formation of Congo Nile divide or trail
- Formation of many swamps and wetlands
- It led to formation of basins e.g. Nile basin such as around Akagera river
- It led to formation of hook's drainage pattern e.g. Nile Akagera.
- It led to river capturing other rivers
- It led to river rejuvenation of some section of rivers
- It led to formation of dendritic drainage pattern
- It led to formation of trellis drainage pattern
- It led to formation of radial, rectangular drainage pattern.

Any three <sup>ones</sup> explained impacts (3 marks)

## SECTION B

(15) a. Name the instrument for recording sunshine

- sunshine recorder or Campbell Stokes sunshine recorder / Apparatus
- correct naming (1 mark)

b. Give three reasons to explain why temperature reduces with an increase in altitude in the troposphere

- It is because of terrestrial radiation
- The effect of adiabatic compression

- The solid nature of the ground
- The gaseous nature of the atmosphere
- The effect of ozone layer
- The effect of man's activities
- Presence of water vapour in the atmosphere
- Distance from the earth's core
- Surface area covered by sun's rays
- Effects of prevailing winds
- Presence of cloud cover in the atmosphere

Any three reasons given (3 marks)

c. Examine factors that affect the sunshine an area receives

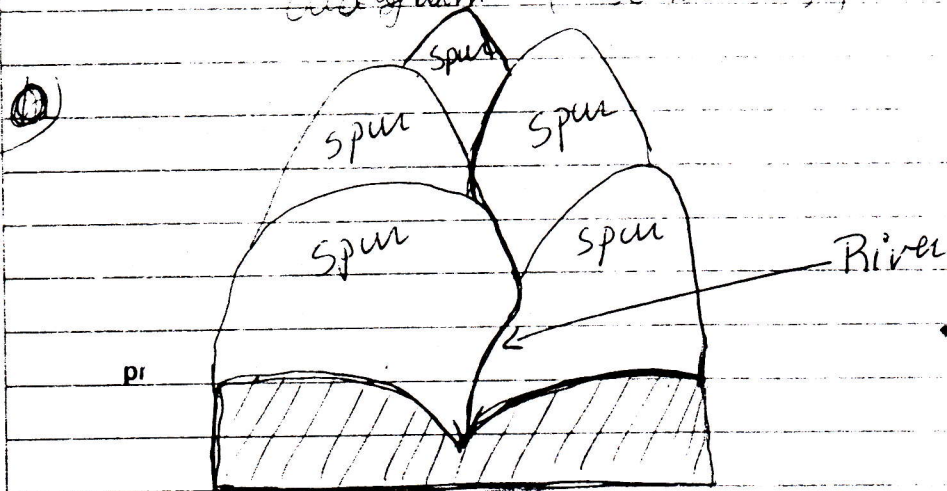
- Aspect
- Distance of the sun
- Latitudinal location
- Nature of the receiving area
- Nature of the atmosphere
- Slope of an area / Relief / Topography
- Cloud cover
- Seasonality
- Distance from the sea / continentality
- The length of the day
- Vegetation cover
- Impurities in the atmosphere
- The effect of ozone
- Altitudinal effect
- Man's activities
- Rotation of the earth
- Influence of water bodies
- Time of the day
- The effect of ocean currents
- Humidity

Any six explained factors (6 marks)

Abra explain the term "interlocking" spurs  
 these are interlocked hillsides of features  
 formed when the earth surface with alternating  
 hard and soft rocks are cut by the  
 running water

Interlocking spurs are ridges of resistant/ hard rock obstacles that makes a river in the upper stage to flow dodging them

Any correct explanation and use of a well diagram (2 marks)



Any correct explanation and well drawn diagram (2 marks)

be with specific examples, examine the effects of river erosional and depositional features on human activities

oxbow lakes provide water for domestic and industrial uses

Deltas attract settlement

Flood plains are used for agriculture due to presence of fertile alluvial soil

Fishing can take place e.g. oxbow lakes

They led to development of quarrying and mining e.g. sand and other minerals like petroleum are common in deltas

water falls act as sites for generation hydroelectric power

Leves help in controlling flood plain They attract tourists who bring foreign exchange

They are used as grounds of education research.

Deltas are colonised by swamps which provide low material for ~~land crafts industries~~ creation of recreational ground. flood plains

### Negative effects

Some deposited soil in flood plains are poor and infertile which discourages agriculture.

water falls and rapids discourages water transport / Navigation

low lands along old stages of the rivers are affected by flooding with its associated effects

Deltas harbor disease carrying vectors.

ex: ~~Mosquitoes~~ Mosquitoes which cause malaria

Any 8 effects with examples 8 marks

(17) a) with the aid of a diagram, explain the term Rainfall regime.

Rainfall <sup>orcs</sup> regime: refers to seasonal variation in the amount of rainfall received in an area.

Any correct explanation (3 marks)

Any diagram used to show rainfall variation like -> Table

-> graph

-> circular graph

2 marks

b Account for the variation of mean annual rainfall in East Africa

Influence of prevailing winds

Relief / Topography

Distance from the sea / continentality

- Influence of water bodies
- altitudinal locations
- vegetation cover
- Influence of ocean current
- Human activities, eg. Bush burning, overgrazing, industrialisation
- Latitudinal location of an area
- edaphic factors soil differences
- influence of ITCZ (Intertropical convergence zone)

- Aspect
- Coastal configuration
- Influence of pests and diseases which attack and destroy the vegetation.

Any 3/5 x well explained factors (6 marks)

18) Study the data on THERIPUNJI weather station in India below and answer the questions that follow:

Month	J	F	M	A	M	J	J	A	S	O	N	D
Temperature	30	31	31	31	30	29	28	28	29	29	29	30
Precip (mm)	250	250	325	300	213	25	25	25	100	275	200	200

- a) Describe the type of climate in this weather station
- There is tropical monsoon or equatorial climate
  - It receives rainfall throughout the year
  - Temperatures are high throughout the year
  - Annual temperature range is 3°C
  - The station receives two rain fall seasons a.
  - Annual total rain fall received is 2368mm
  - Highest rain fall is received in Nov, March, April
  - lowest rain fall is received in June, July, August
  - Any 2 descriptions (2 marks)

18

b. Calculate the temperature range of this station  
TR = Highest  $t^{\circ}$  - lowest  $t^{\circ}$   
 $31^{\circ} - 28^{\circ}C = 3^{\circ}C$

correct calculation (1 mark)

c. Calculate the ~~total~~ amount of rainfall  
Total amount of rainfall

$$250 + 250 + 325 + 300 + 213 + 25 + 25 + 25 + 100 + 275 + 380 + 200 = 2368 \text{ mm}$$

correct calculation (4 mark)

d. Calculate annual temperature average

$\frac{\text{Total temperature}}{\text{Number of months}}$

$$= \frac{30 + 31 + 31 + 31 + 30 + 29 + 28 + 28 + 29 + 29 + 29 + 30}{12} = \frac{355}{12}$$
$$= 29.5^{\circ}C \text{ or } 29.6^{\circ}C \text{ or } 29 \frac{7}{12}^{\circ}C$$

correct calculation 1 mark

(19) Describe factors other than climate, that influence economic activities practiced within the lake victoria basin

- Nature of the soil
- Government policy
- Vegetation cover
- presence of water bodies
- historical background of the area
- urbanisation
- improved transport and communication
- industrialisation
- population
- land tenure system
- Availability of market
- Availability of power supply
- presence of mineral resource

(15)



- High level of education
- political atmosphere
- presence of variety of fish species
- presence of skilled labour
- Improved technology
- presence of many tourist potentials
- presence of enough capital
- low incidence of pests and diseases
- presence of extensive swamps
- cultural and social consideration
- presence of ports eg Mwanza and port bell
- Relief is flat landscape

### N.B: Introduction

Lake Victoria basin refers to the region which surround lake Victoria. This region is one of the mostly densely populated regions in East Africa.

- Introduction (1 mark)
- well explained points with examples (8 marks)
- Outline points (0.5 mark each)
- conclusion (1 mark)

### N.B conclusion:

All in all / to sum up / lastly / Thus, the Victoria basin experiences more economic activities according to the factors given above

### SECTION C

M

20) Study the map extract of Bugarama and answer the questions that follow

a) calculate the amplitude on the map extract

Highest altitude - lowest altitude

$$1200 - 1000 = 200 \text{ m}$$

Highest contour Average

$$1200 - 1100 = 100 \text{ m}$$

$$\text{Average} = \frac{\text{Highest contour} + \text{lowest contour}}{2}$$

Highest contour - lowest spot height

$$1200 - 929 = 271 \text{ m}$$

Highest contour - lowest contour

$$1200 - 950 = 250 \text{ m}$$

Highest spot height - lowest spot height

$$968 - 910 = 58 \text{ m}$$

$$970 - 929 = 41 \text{ m}$$

Any one answer (1 mark)

or

b) Calculate the distance in kilometers (km) from Vinn Bridge to Gilburgue

$$3.5 - 1.5 \text{ km}$$

2 marks

c. Explain the factors that favour

- Enough transport and communication
- urbanisation
- Industrialisation
- Relief / <sup>or</sup> flat gradient
- Enough water supply
- Presence of fertile soils
- Developed technology
- Favourable government policy
- political stability / security
- Religious factors
- Enough food supply
- Trade and commerce
- Good climate
- Presence of savanna vegetation for <sup>animal</sup> rearing
- Enough market

Any four explained factors (4 marks)

d) Describe the relief of the area covered by the map extract

$$\text{Average} = \frac{\text{Highest contour} + \text{lowest contour}}{2}$$

Highest contour - lowest spots height  
 $1200 - 929 = 271 \text{ m}$

Highest contour - lowest contour  
 $1200 - 950 = 250 \text{ m}$

Highest spot height - lowest spot height  
 $968 - 910 = 58 \text{ m}$

$$970 - 929 = 41 \text{ m}$$

Any one answer (1 mark)

or

b) Calculate the distance in kilometers (km) from Viroa Bridge to Gilburgue

$$3.5 - 1.5 = 2 \text{ km}$$

2 marks

c) Explain the factors that favour

enough transport and communication  
urbanisation

Industrialisation

Relief <sup>or</sup> flat gradient

Enough water supply

Presence of fertile soils

Developed technology

Favourable government policy

political stability/security

Religious factors

Enough food supply

Trade and commerce

Good climate

Presence of savanna vegetation for <sup>animal</sup> rearing

Enough market

Any four explained factors (4 marks)

18

d) Describe the relief of the area covered by the map extract

- Flat / plain / low land in the central part
- upland / hilly / steep slopes in the western part
- ~~and~~ eastern part
- valley
- gentle slopes

Any two descriptions 2x2 (4 marks)

e) Show the relationship between drainage and settlement patterns.

people are attracted near rivers for fishing  
Drainage features like swamps in the central area of the map discourage settlement.

well drained areas like eastern parts attract settlement.

Any two descriptions 2x2 (4 marks)

21) Study the photograph below and answer the questions that follow

a) Identify the type of economic activities carried out in the area covered by the photograph and give evidence to support your answer.

Rice growing / Agriculture / farming evidenced by crop gardens

- Forestry / lumbering evidenced by trees

- Fishing due to existence / presence of water streams

- mining and stone quarrying evidenced by the hilly back ground

- pottery and brick making

Tourism

- charcoal burning due to the trees

Hunting

- Transport by human portage

Any three identified activities with their evidences

one Activity (1 mark) Evidence (1 mark)

(20)

(i) Name the crop grown in the foreground and middle ground of the area shown in the photograph  
→ Rice (1 mark)

or

other crops like Onions, young tea, carrots, wheat, maize, flowers 0.5 mark

(ii) Outline the conditions necessary for the successful growth of the crop identified in (a) (ii)

- Relief of the area
- Heavy rainfall
- High temperature for rice ripening
- Favourable government policy
- Ready market
- Presence of enough land
- Good means of transport and communication
- Presence of agro-based industries
- Extensive water supply
- \* Good seed varieties
- \* use of modern methods of farming
- \* political stability
- \* presence of investors
- \* Improved research
- \* presence of extension services by agronomists

Any two outlined conditions (2 marks)

(iii) Describe the relief of the area shown in the photograph

- Flat/plain/lowland in the foreground and middle ground.
- Gentle slope in the left back ground.
- Hilly/steep slope in the right back ground.

Any one description 1 mark

(iv) Name one area in Rwanda where the activity identified in (a) (i) above is likely to be carried out

→ Any area in Rwanda except province

(v) Outline the benefits of the activity identified in (a) above to the local people and the economy where it is carried.

- creation of employment opportunities
- enough food supply
- development of social services e.g roads
- Farmers get agro-based skills

- increase on people's income levels
  - improvement on people's standards of living
  - Diversification of the economy.
  - creation of self reliance/economic independence
  - Promotion of educational research and trees in the back ground
  - It led to proper utilisation of land
  - Creation of international relationship among the countries
  - source of government revenue through taxation
  - source of foreign exchange through crop export
  - creation of good terms of trade and balance of payments
  - Crop residues are used as animal feeds
  - It helps in environmental protection and modification of climate
  - it leads to urbanisation
  - it leads to industrialisation
  - Development of Agriculture
- Any three points (3 marks)

c) i) what are the problems facing the activity identified in (a) (i) above?

- unfavourable climate
- Pests and diseases
- Poor and infertile soils
- Lack of enough capital
- Lack of enough skilled labour
- limited market
- limited social services - eg roads
- Poor seed varieties
- Lack of enough water supply
- competition from other activities and
- low levels of technology
- Flooding
- limited land
- lack of enough agro-based industries

- Insecurity
- price fluctuation
- low levels of education
- Negative attitude towards rice growing
- lack of enough government support
- problem of weed
- predators (birds).

Any two elements (2 marks)

- ii) How can the problems identified in (c) (i) be solved by the local people?
- By use of better methods of farming
  - use of proper water harvesting systems to avoid shortage of water
  - use of chemicals / pesticides
  - construction of roads for transport
  - Employing agricultural field officers to provide extension services to people
  - use of land consolidation
  - production of better quality products
  - construction of dams
  - improving technology through mechanisation of agriculture
  - provision of loans
  - Formation of cooperative societies
  - Attracting of foreign investors
  - promoting agricultural research
  - By trade protectionism
  - wide advertisement to create market

Any two elements (2 marks)

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Muriën — END —

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