GEOGRAPHY NOTES

CLIMATE

Specific Objectives

By the end of the topic, the learner should

a. distinguish between weather arid climate
b. explain the factors that influence climate
c. describe the characteristics of climatic regions of Kenya
d. describe the characteristics of major climatic regions of the world
e. account for the causes of aridity and desertification
f. explain the effects and possible solutions to aridity and desertification
g. discuss the causes and impact of climate change on the physical and human environment.

CLIMATE

Climate means the usual condition of the temperature, hu
ological elements in an area of the Earth's surface for a long time. In simple terms climate is the average condition for
about thirty years.

Average weather conditions of a given place over a l

Factors Influencing Climate

Latitude

- It influences temperature whereby low latitudes
ature due to the angle at which the sun rays strike the earth and the distance travelled by the suns rays.
- It also influences rainfall whereby places in th
overhead more than once a year while land southern tropical areas
sun is overhead in those areas.

Inter-Tropical Convergence Zone

- It's a low pressure belt around equator whe
- It influences rainfall in the following way
- Places further from equator experience one
season when the sun is in the S. hemisphere
- Regions near equator have 2 seasons of heav
twice.

Altitude

- It influences temperature whereby at
titude its lower due to the thickness
to store heat and distance from space
- It also influences rainfall whereby m
graphic rainfall and the windward slop

Learner's Short Notes

Distance from the Sea

- It influences temperature whereby places in ture during summer onshore winds blowing ove on adjacent land because the water is heated
- Places near the sea also experience higher t breezes carrying warmer air to the land beca
- Temperatures in the interior of continents t lack of marine influence.
- It also influences rainfall whereby coastal and the continental interiors receive less r dropped most of moisture along the way.

Ocean Currents

- It influences temperature whereby coasts whi while those washed by cold ocean currents ar or cooled and then taking the warmth or cool
- It influences rainfall whereby coasts washed moist onshore winds are warmed by the curren on reaching the land.
- The coasts washed by cold ocean currents on moist winds being cooled and moisture in the thereby bringing little or no rain to the co Kalahari and Namib deserts.

Aspect

Direction of slope in relation to sunlight and nounced in the northern and southern hemisphere

- In the N and S hemispheres the slopes facing
- The slopes in the direction of rain winds i. the leeward side.

Learner's Short Notes

Winds and Air Masses

Wind blowing from a warm region warms the re
region cools the region it's passing over si

- Sea breezes take cooling influence on land
- Katabatic winds cause low night temperature
- Fohn and Chinook which are descending dry w
  and Rockies.

Winds influence rainfall in the following ways:

- Anabatic winds cause afternoon showers on m
- Moisture laden winds cause heavy rainfall.
- Persistent dry winds cause desert like cond
  from Sahara which blow over W. Africa.
- Regions around large water bodies experience

Configuration of Coastline

Coastal regions across the path of moisture
posit moisture on land e.g. Mombasa while th
less rainfall because moisture is deposited

Forests

Forested areas experience a micro climate where

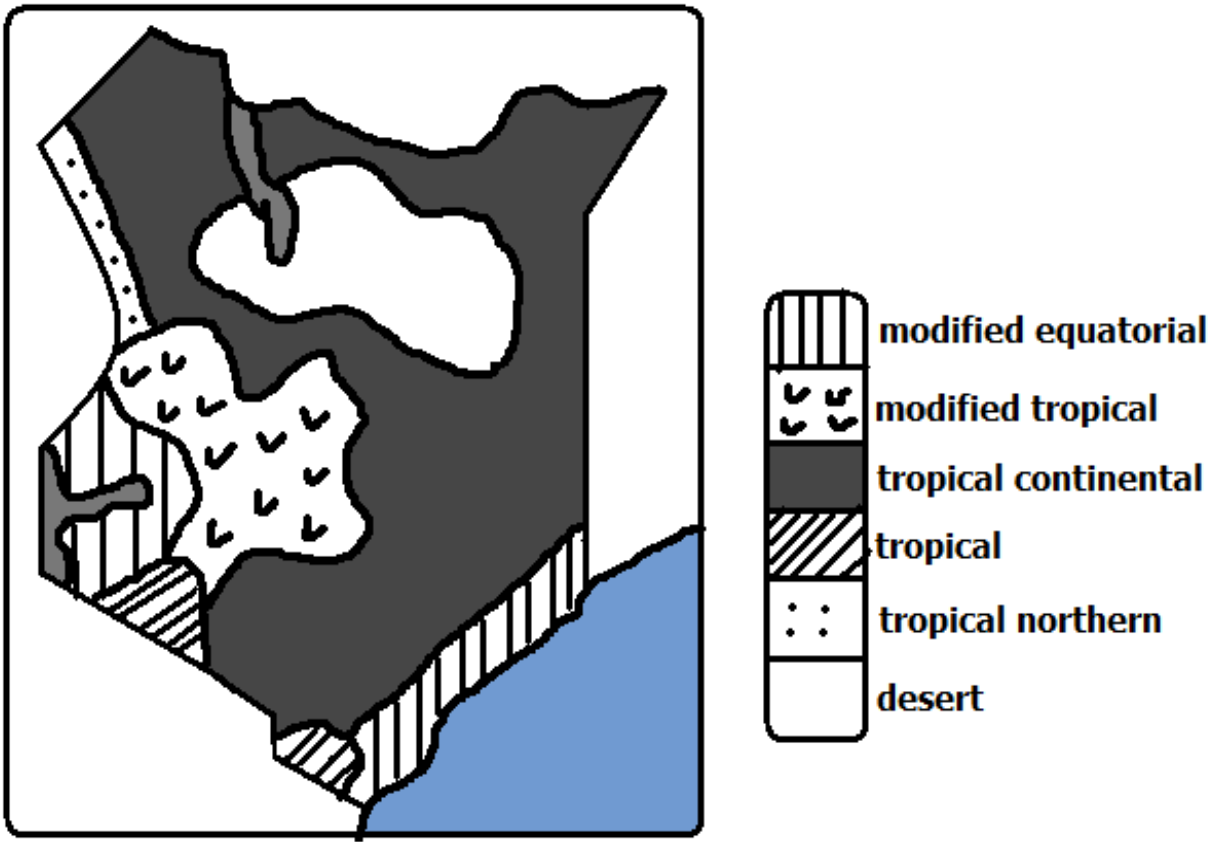
- Temperature is lower due to shades of trees
- Rainfall is heavier due to high rate of eva
  bearing winds.

Learner's Short Notes

Human Activities

- Man has caused deforestation in the process which has caused drop in-arriadi ncfoanldli taimoonusn.t s l
- Man has constructed dams across riv-aerrisdaned-gions to become wetland.
- Gases especially co2 emitted from burning f al warming through the green house effect a

The Climatic Regions of Kenya



Learner's Short Notes

Modified Equatorial Climate

Experienced along the coa-Tanzanian along the coast L
gions around the lake.

Along the Coast

Characteristics

- High temperatures throughout the year mean
- Small mean annual range of temperature abou
- Hottest months are December and January.
- Experiences rainfall throughout the year/ n
- Double maxima rainfall regime (2 rain seaso
- High humidity due to high temperature causi

L. Victoria Basin

Characteristics

- Temperature is lower than the truly equator (mean annual range) between 22
- There are no real dry months.
- Heavy rainfall-600mm ranging from 1000
- Double maxima rainfall regime.
- Receives convectional type of rainfall whic
- High relative humidity due to high temperat moisture.

Modified Tropical Climate

Experienced in central highlands E and W

Learner's Short Notes

Characteristics

- Mean annual temperatures averages between 1
- Lower warmer slopes and cooler higher slope
- Receives rainfall throughout the year (1000
- Receives Orographic rainfall caused by S.E
- Double maxima rainfall regime in eastern hi
- Humidity is moderate.

Tropical Continental / desert Climate

Experienced in about ½ of Kenya in most of N,

Characteristics

- High temperatures throughout the year with
- Generally dry with less than 500mm of unrel
- Large diurnal range of temperature.
- The skies are generally clear.
- Low humidity.
- Temperature has been modified by altitude

Tropical Climate

Experienced in Narok, S. Taita and Kwale region

Characteristics

- High temperature
- Temperature is modified by relief in has made the place suitable for human
- Generally low rainfall amounts.
- Rain falls in one season.
- A long dry season lasting up to 6 mon

Learner's Short Notes

Tropical Northern Climate

Experienced in a small area in the N. W part of

Characteristics

- High average temperatures.
- Temperatures are modified in some pla
- Low mean annual rainfall of about 850
- Rain falls mainly in June and Septemb
- Experiences a long dry season of up t

Desert Climate

Experienced in central northern Kenya where the

Characteristics

Temperatures are very high throughout the year

- Very low rainfall of less than 250mm per ye
- Characterized by diverging or descending wi
- Night temperatures are extremely low.
- Humidity is low.
- Sandstorms are common occurrences.

World Climatic Regions Classifications

1. Hot climates
2. Warm climates
3. Cool climates
4. very cold climates
5. Mountain climates
6. micro/local climates

Learner's Short Notes

Hot / Tropical Climates

Experienced within the tropical latitudes.

Subdivided into:

i) Equatorial climate
ii) Tropical monsoon climate
iii) Savannah climate/ Sudan type
iv) Tropical desert climate
v) Tropical marine climate

Equatorial climate

Experienced in the following areas:

a) Amazon basin in S. America.
b) Along west coast of Africa from guinea to
c) Southern part of Nigeria through Cameroon, Zaire.
d) S.E Asia in Malaysia, Indonesia and a stre

Characteristics

- High temperatures throughout the year (high)
- Temperature neither rises nor drops too low
- Heavy rainfall throughout the year (mean an
- Double maxima rainfall regime.
- Experiences convectional rainfall in low la
- High relative humidity of over 80% due to c spiration rates.
- Low pressure all year round.
- There are no seasons

Learner's Short Notes

Tropical Monsoon Climate

It's found in the following areas:

- S.E Asia in parts of Pakistan, India, Ban
- Along the northern .coastal region of Aust

Characteristics

a. High mean annual temperatures of about 28
b. Seasonal reversal of winds.
c. Heavy rainfall when mo- (1300 mm) winds ons
d. Rain falls in a few months and the rest o
e. Low pressure in summer when winds blow on
f. High pressure in summer when winds blow o
g. Cloudy skies in summer and clear skies in

Tropical Marine Climate

It's found on windward slopes of islands and c
S.E Trade Winds in the following areas:

(a) America in S. Mexico through Guatemala,
(b) coast of S. America.
(c) aribbean islands of Cuba, Haiti and Jamai
(d) oastlands of E. Africa from Kenya, Tanzani

Characteristics

i) Summer temperatures are very high approxi
ii) High rainfall totals in s- (2000 mm) when winds
iii) Orographic and convectional rainfall in su
iv) Dry winters due to winds being offshore.
v) High humidity due to coastal location.
vi) Experiences tropical cyclones towards end
vii) Winters are cool (about 21◦c).

Learner's Short Notes

Tropical Continental / Savanna / Sudan type

The largest natural climatic region in Africa.

It's found in the following areas:

a) In Africa it extends from Senegal through
b) Western Madagascar.
c) A broad belt in N. Australia.
d) N.W and S.E of Amazon Basin called Llanos

Characteristics

a. Higher temperatures of up to 32◦ in hot sea
b. Large diurnal range of temperature in dry
c. Convectional rainfall in summer averaging
d. High humidity during the hot wet season.
e. Low humidity in cooler drier months.
f. Prevailing winds are mainly trade winds.

Types of deserts

- **Erg** - Sandy deserts with large amounts of depos
- **Hamada** - **Rocky** deserts made of bare surfaces.
- **Reg** - Rocky deserts covered with angular pebbl
- Hot continental interior deserts found on t mountains e.g. Sahara and Arabian Desert.
- Coastal deserts of western margins characte rents e.g. Atacama of S. America, Namib in
- Mid latitude deserts of continental interio Asia.
- Ice and snow deserts of polar lands like G

Learner's Short Notes

Tropical Desert Climate

Found on the western coasts of continents washe

They are the following:

a) Arabian Desert of the middle East
b) Sahara, Kalahari and Namib deserts in Afri
c) Atacama Desert in S. America.

Mohave and Colorado deserts of U.S.A. and Mexic

d) Jordan, Syria, Iran, Iraq, Saudi Arabia, I
e) The great Australian desert in the greater

Characteristics

a) High temperatures during the day and very
restrial radiation.
b) Large diurnal range of temperature.
c) Clear/ cloudless skies.
d) Receives less than 250mm of rainfall annua
e) Rainfall is localized, short and tor
flash floods.
f) Rain falls for a short period and t
dry.
g) High wind velocity due to little fr
h) Some areas experience temperatures
the oasis.
i) Humidity is low and evaporation rat
j) Sand storms are very common i.e. sa
wind.

Learner's Short Notes

Warm Climates

They border tropical climates and they experien

They are situated in the zone of divergence of t

Subdivided into:

1. Warm temperate Western margin/ Mediterranean
2. Warm Temperate Interior/continental Climate
3. Warm temperate Eastern marginal Climate.
4. Warm temperate Deserts.

Warm Temperate Western Margin

Also known as *Mediterranean Climate.*

Found on the western margin or sides of contin

i) Southern Europe and N. Africa in the lands
ii) S. W tip of Africa around Cape Town.
iii) Central Chile in S America.
iv) S. W and S Australia

Characteristics

a) Hot summers with temperatures of about 21°
b) Mild winters with temperatures of about 1
c) Characterized by hot and cold local winds
d) There is high sunshine duration and intens
e) Experiences cyclonic rainfall in winter wh
f) Rainfall decreases inland.
g) Summers are dry due to trade winds blowing
h) There are distinct seasons i.e. summer, au

Learner's Short Notes

Warm temperate Interior Climate

Also known as *Steppe Type*.

It's found in the interior of continents in the

a) Steppe Land of U.S.S.R.
b) Veldt of S Africa.
c) Prairie lands of Canada and U.S.A.
d) Pampas lands of Argentina.
e) Downs of. Australia

Characteristics

- Warm short temperatures between 18
- Long winters with extremely low temp-2 0atures
- Precipitation is received all the year round
- Most rainfall is received in summer and snov
- Rainfall is moderate with annual mean of 500
- Summer rainfall is caused by convection and
- There is high humidity in summer.

Warm temperate Eastern Margin climate

Also known as *China Type*.

It's experienced on the eastern margins of cont

a) S.E China and S. Japan.
b) S.E Australia.
c) S and S.E states of U.S.A.
d) S. America in S. Brazil, Uruguay, E. Parag

Learner's Short Notes

Characteristics

- Hot summers with a mean annual of about 26°
- Mild to cool winters due t-b3 ma)r.ine influenc
- Receives rainfall throughout the year (abou
- Convectional rainfall is common in summer.
- Rainfall is moderate between 760 and1500mm.

Warm Temperate Deserts

Also know-Ln ais tuMied Desert climate.

It's experienced in the following areas:

i) Nevada and Utah states of U.S.A.
ii)Pentagonia in S. America.
iii)Gobi Desert extensive desert area of south
sert in Asia.
iv)Turkey, Turkmenistan, Uzbekistan and Kazak

Characteristics

i. High summer t-3e7mpe)r.atures (27
ii.Cold winte-7rsc.as low as
iiiVery large diurnal and annual ranges of te
iv.Low and unreliable rainfall due to great d
v. Most rainfall falls in late winter or earl

Learner's Short Notes

Cool Climates

They differ from warm climates by having defini

Subdivided into:

- Cool Temperate Western Margin
- Cool Temperate Continental Interior
- Cool Temperate Eastern Margin

Cool Temperate Western Margin Climate

Also known as ***British Type***.

It's under coastal influence.

Found in the following areas:

a. British Isles (Island)
b. Central and N.W Europe
c. N.W U.S.A. and British Columbia in Canada.
d. S. Chile
e. Tasmania in Australia

Characteristics

i) Warm summers (13.5°C)
ii) Cool winters (2-7°C)
iii) Small temperature range.
iv) Well distributed rainfall throughout the y
v) Cyclonic rainfall in the coastal lands and
vi) High humidity in winters.
vii) Long summer days with irregular thundersto
viii) Convergence of tropical and polar air masses.
ix) Onshore westerly winds are dominant.

Learner's Short Notes

Cool Temperate Continental Interior Clima

Also *Siberian type*.

Found in the following areas:

- Alaska and most of Canada
- Eurasia covering Sweden, Finland, Poland, C
  Peninsular in the east

Characteristics

i) Warm summers with temperatures of about 18
ii) Generally short summers.
iii) Extremely cold winter temperatures which g
iv) Long winters with long nights.
v) Precipitation is mainly in form of snow dur
vi) Convectional rainfall in summer is accompan

Cool Temperate Western Margin Climate

It's also *Laurentian Type* as

Areas:

a) N. U.S.A. and S Canada.
b) S. Argentina.
c) N & S Korea, N. China, C and N Japan and E

Characteristics

- Long warm summers with temperatures of about
- Cold winters (-4 to 0°c).
- Precipitation -1000mm) ar round (600
- Snow precipitation in winter.
- High humidity in summer

Learner's Short Notes

Cold Climates

Also known as ***Polar Desert Climates*** or ***Arctic and Antarctic Climates***.

Found beyond Arctic Circle i.e. 66 ½° N ar

Classified into ***Tundra and Polar Climates***.

Tundra Climate

Areas:

a. Coast of N. America bordering Arctic Ocean
b. N part of America from Alaska through Cana
c. From N coast of Scandinavia to the N.E of
d. Baffin Island.

Characteristics

i) Short cool summers with average temperature
ii) Long cold winters (-29°C)
iii) Continuous days in winter and summer for s
iv) Low annual precipitation of about 250mm.
v) Precipitation in form of rain and snow in

Polar Climate

Experienced at the poles in the interior of Ice

Characteristics

- Temperature is permanently below freezing po
- There is permanent snow cover and ice on the
- Snow storms (blizzards) are common.
- Continuous winter nights and summer days wit

Mountain Climates

Experienced on high mountain ranges of the worl

Learner's Short Notes

Areas:

a. Mt. Kenya (5199)
b. Mt. Ruwenzori (5109)
c. Mt. Kilimanjaro (5895)
d. Mt. Everest (8848)
e. Atlas mountains in Africa
f. Rockies of N. America
g. Alps of Europe
h. Himalayas in Asia

Characteristics

1. Temperature decreases with increasing alti
2. Temperature ranges from cool to cold.
3. Experiences Orographic rainfall.
4. Rainfall increases with altitude up to 300 has poor capacity to hold moisture.
5. Windward slopes are wetter than leeward sl
6. Atmospheric pressure decreases with increa
7. Local winds are common and blow up the slo
8. In temperate regions slopes facing the equ
9. Atlas mountains in Africa
10. Rockies of N. America
11. Alps of Europe
12. Himalayas in Asia

Local / Micro Climates

Climate experienced within a small area which i
area.

It occurs on the immediate surroundings and wit

Micro-climates can be found in the following areas

Learner's Short Notes

a) **Within and around a forest**

- Experience low temperatures due to trees p ground.
- Experiences high rainfall due to high rate

b) **Urban areas**

- Higher temperatures due to green house eff that is given off by the earth (terrestria perature of the lower atmosphere to increa

c) **Around man made lakes**

- Experience high convectional rainfall due
- Around natural lakes experiences land bree breezes which lower temperatures during th

Aridity and Desertification

Aridity is the state of land being deficient of moisture le

Desertification is the process in which desert like conditions tive agricultural land.

Causes of Aridity and Desertification

1. Low and unreliable rainfall below 250mm per of animal and biological life causing soil f
2. High temperatures which cause high rates of peratures which reduces air capacity to hold
3. Where a place is washed by ocean currents c moisture over the sea and reach the land as the cold Benguela Current.
4. Where relief barriers such as hills or moun rain winds drop most of their moisture on th are warmed and hold onto moisture causing dr shadow of Drakensberg mountains.

Learner's Short Notes

5. Location of some places very far from the se
winds e.g. Gobi Desert.
6. Where hot dry winds blow over a region causi
rica.
7. Where cool air descends causing no rain beca

Human Activities

8. When people clear forests which causes runof
cycle.
9. Keeping large number of animals which exceed
leaving the land bear exposing the land to s
10. Poor agricultural practices such as overcult
lead to soil erosion.
11. Industrialization which release greenhouse gases which trap
more heat making the earths temperature to r
12. Reclamation of water logged areas which lowe
plants when plants can't access ground water
13. Poor irrigation methods when evaporation ta
face and are deposited on the top soil makin

Effects of Aridity and Desertification

1. Infertile soils which support little or no
2. Low agricultural production due to insuffi
3. Shortage of water for domestic and industr
sons.
4. Migration of people from areas affected by
sure and eventually conflicts.
5. Destruction of vegetation which exposes la
6. Can lead to extinction of some plants and

Learner's Short Notes

Solutions to Aridity and Desertification

1. Afforestation and reafforestation because t lease moisture to the atmosphere leading to
2. Adopting soil conservation measures such as etc.
3. Rearing a number of animals which is propo
4. Irrigating dry lands.
5. Introduction of energy saving stoves to re tion.
6. Use of alternative sources of energy which
7. Introducing drought resistant crops in the
8. Controlling industrialization by setting la

Climate Change

Establishment of a new climatic state.

Continuous changes in climatic states such as t

Causes of Climate Change

Natural Causes

1 Variations in the Earths Orbital Charact

Changing or earths orbital characteristics with (perihelion) when the earth is nearest to the s when the earth is farthest from the sun and rec

2 Variation in the Atmospheric Carbon Diox

When natural rise in temperature cause carbon d mosphere after oceans warmed.

Learner's Short Notes

3. **Volcanic Eruptions**

- When large quantities of volcanic ash and du
  solation from reaching the earths surface ca
  short period.
- When sulphur dioxide given off during volcan
  layer within stratosphere reducing the amoun
  some of it back which also lowers temperatur

4. **Variation in Solar Output**

Changes in the amount of solar energy given off
ture on the earths surface and at others its giv

Human Causes

1. Burning of fossil fuels in industries, tran
   65% of additional CO_2 into the atmosphere which is the ma
2. Burning of vegetation e.g. in shifting cult
   phere.
3. Clearing large tracts of forests foe agricu
   tem for removing CO_2 from the atmosphere by photosynthesis.
4. Industrial developments which add gases li
   rine and chlorofluorocarbons which damages
   tra violet radiation given off by the sun w

Consequences of Climate Change

1. Global warming due to green house effect by
   ozone layer.
2. Increased rainfall as a result of high temp
   areas to become wetter and dry areas to bec
3. Effect on agriculture by causing crop growi
   wheat growing areas of Canada shifting to t
   in area where temperatures have increased.

Learner's Short Notes

5. Water shortage when climate becomes drier hence less water to feed rivers.
6. Submergence of coastal areas causing flood is added to the oceans.
7. Heat waves due to increased temperature wh
8. Receding and disappearance of ice caps on
9. Abnormal growth of plants CO_2 adduse int go iinncrreeaasseedd thesis which may lead to increased yields o high rates of plant growth.
10. increased levels of ultra violet radiation ing crop production by slowing photosynthes aging plankton which fish eats and degradat

Solution to Climate Change

a) Afforestation and reforestation.
b) Use of energy saving stoves to reduce the
c) Use of alternative sources of energy which instead of fossil fuels.
d) Proper maintenance of vehicle to reduce em
e) Use of public transport to reduce the CO_2 amou added into the atmosphere.

Learner's Short Notes

PAST KCSE TESTED QUESTIONS

CLIMATE

1. (a) (i) What is climate? (2mks)

(ii) Explain two effects of climate change on the

2. The table below represents rainfall and temperations that follow

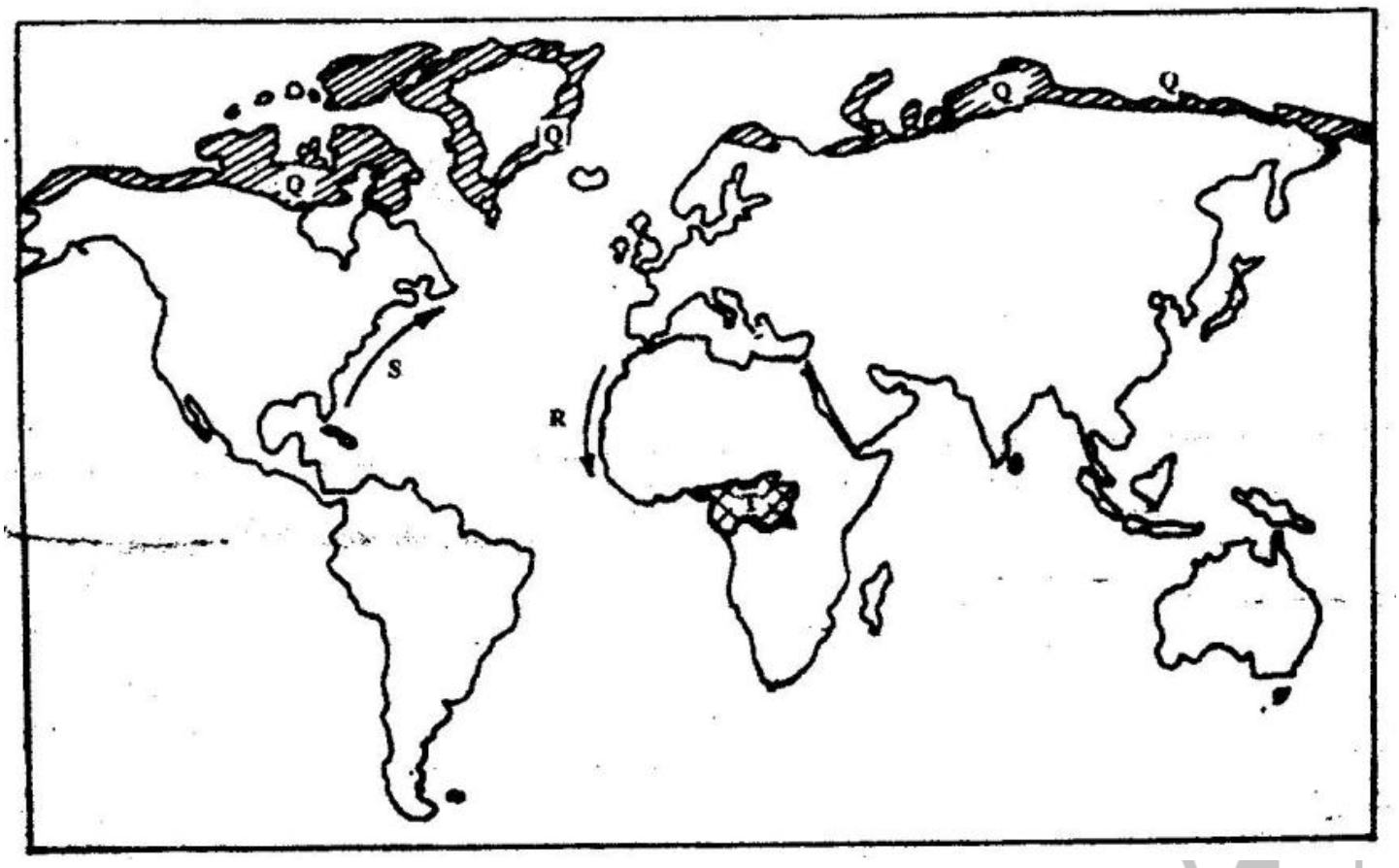
Month	J	F	M	A	M	J	J	A	S	O	N	D
Temp (°C)	27	28	28	28	27	25	25	24	25	26	27	26
Rainfall (mm)	15	38	99	140	277	439	277	69	142	201	71	25

(a) Calculate the annual range of temperature for

(b) Calculate the total annual rainfall for the t

(c) State two characteristics of the climate expe

3. Use the map below to answer questions (a) and



(a) Name:

(i) The type of climate found in the shaded ar

(ii) The ocean current marked R and S (2mks)

(b) Describe the characteristics of the type of

(c) Explain how the following factors influence

(i) Altitude (4mks)

(ii) Distance from the sea (4mks)

(d) (i) Describe a suitable site where you would

(ii) Give reasons why a Stevenson's screen is:

-Painted White (2mks)

-Has louvers (2mks)

4. Describe the characteristics of natural vegeta

5. Give five characteristics of hot desert climat

6. How does the following factors influence clima

(i) Wind/air masses.

(ii) Latitude.

7. Explain characteristics of climatic conditions

8. Explain four ways in which mountains influence

9. What is greenhouse effect? (2mks)

10. How do human activities influence climate cha

11. How does clearance of vegetation cause climat

12. Define climate. (2mks)

13. What is isothermal layer? (2mks)

MARKING SCHEME

1.

a) Climate is the average weather conditions of the atmosphere of a place for a long time usually 30 years.

b) Disruption of natural ecosystems due to ecological changes that affect existence of some organisms and resources.

(i) Abnormal fast growth of plants due to increased carbon dioxide

(ii) Flooding from rising sea due to melting of anteretic ice.

(iv) Increased rainfall to between 7% and 11% annually due to increased rate of evaporation.

(v) Severe draughts due to reduced rainfall.

2.

a) 280C – 240C = 40

b) 1803 mm

c)

- The town experiences high temperatures throughout the year.
- The annual range of temperature is small about 40C.
- The rainfall pattern has double maxima
- The wettest month is June / the driest months are December and January
- The total annual rainfall is high 1803 mm.

3. a)

(i) Polar climate

(ii)

R-Canary current

S-Gulf stream current

b)

- High temperatures all year about 270C
- Low diurnal range of temperature of approximately 60C
- High rainfall of between 1500mm and 2000mm throughout the year.
- High humidity due to high rainfall and high evaporation
- Major winds are S. east and North East trade winds
- Thick cloud covers th...
- Rainfall is mainly co... by thunderstorms
- Long hours of sunshin...
- Low atmospheric pres...

c)

(i) How altitude influenc...

- Temperature decreases ... height above sea level ... mospheric air is dens... high altitude.
- There is grater heat ... due to few obstacles ... going terrestrial radi... peratures.
- Air pressure is highe... to greater weight of a...

ii) Distance from the sea

- During summer cooler w... are onshore and modify ... the coastal land.
- During winter the sea ... tively warmer than lan... effect to the coastal ... temperature.
- Onshore winds carry a... the land bringing rain...

4.

i) Characteristics of nat... ated with equatorial c...

ii) The natural vegetatio... forest vegetation.

iii) Growth of this vegeta... rainfall well distribu... year.

iv) Forests consist of ta... and smooth stems. The... height of 40 metres be... for sunlight.

v) The trees form canopy.
vi) Forest is characterized by only a few species of trees of different species.
vii) Trees have broad leaves which are shed during the dry season.
viii) Many trees have buttresses mainly for support.
ix) Forest is evergreen.

5. Five characteristics of hot desert climate
a) Low annual rainfall / dry climate.
b) Occasional flash floods / sporadic rains.
c) Clear sky / clear sunny days / high terrestrial radiations.
d) High temperature during the day.
e) Relatively low temperature at night / high diurnal range.
f) Strong winds
g) Low humidity
h) High evaporation
i) Unreliable rainfall

6. How following factors influence climate:
i) Wind / air masses
- Warm winds bring warming influence in the cool lands leading to warming effects.
- Areas under influence of dry winds have little or no rainfall while areas under influence of moist winds are usually wet.

ii) Latitude
- Areas near equator are hotter than areas far away from equator. This is due to concentration of sun rays per unit area at the equator.
- Amount of solar radiation and temperatures decreases downwards.

7. Climatic conditions experienced in the Kenya highlands.
(i) Region receives rainfall throughout the year.
(ii) Total rainfall ranges from 1000 mm to 1500 mm.
(iii) The region has double maxima in east and single maximum in west.
(iv) Rainfall is higher on the windward slopes than on the leeward slopes.
(v) Rainfall is caused mainly by relief and convectional systems.
(vi) Average temperature range from 17°C to 24°C.
(vii) Area receives mainly less than 250mm / dry climate.

8.
a. Because of aspect slopes facing the sun are warmer than slopes facing away from the sun.
b. The mountains cause an adiabatic cooling effect that causes condensation during the night.
c. Reduction of air pressure with increase in altitude.
d. Occurrence of relief rainfall on the windward side as an influence of altitude.

9. Green house effect is a process by which short wave solar radiation passes through the atmosphere but is trapped by clouds and other gases which absorb outgoing terrestrial radiation thereby influencing the atmosphere to be warmer than it would be if much of terrestrial radiation escaped to outer space.

10. Climate change due to human activities
- Burning of fossil fuels which releases carbon dioxide gas to the atmosphere.
- Forest and grassland fires which release carbon dioxide gas to the atmosphere.
- Industrial and agricultural activities which release carbon dioxide gas to the atmosphere.
- Clearance of vegetation which leads to increased carbon dioxide in the atmosphere. This is due to concentration of carbon dioxide from the atmosphere in photosynthesis, there is inadequate vegetation to absorb the excess carbon dioxide gas and the atmosphere warming.

12. Climate is the average weather conditions of a place or region which have been recorded over a long period of time usually 30 years or more.

13. Isothermal layer is a layer within the atmosphere within which temperature remains constant with increasing height.