Geography (UACE 250/2) paper 2 Revision question of Population distribution, growth, characteristics and problems in selected region in the world

1. **Describe the influence of climate on population distribution in Africa. (25 marks)**

(*Candidates are expected to describe the distribution of the population in Africa i.e. there area with high population, moderate and low population; the influence of climate; then evaluate the question by stating other factors.)*

Solution

- High population areas include **West** Africa, along the coastal region (south of the Sahel), Ethiopian high lands, the highlands of Rwanda and Burundi. the Lake Victoria basin, the South African *coastal* areas, the Nile valley of Egypt, the coast of the Mediterranean Sea in North Africa, urban areas g. Cairo, Alexandria, Lagos, Nairobi, Kinshasa, Johannesburg etc.
- The moderate population areas include; Savannah region of Africa, the Mediterranean coast lands in North and South Africa etc.
- The low population areas include; the Sahel region, the Sahara, the Namibia and Kalahari deserts, the horn of Africa, Northern Kenya, and the Nyika plateau, Central Tanzania etc.

The influence of climate on population distribution in Africa include

- Areas of highly rain fall of over 1500m have high population densities g. the coastal regions of west Africa the lake Victoria basin, the high lands of Rwanda and Burundi.
- Areas receiving moderate/ seasonal rainfall 750 – 1000mm have moderate populations e.g. the savannah regions of Africa
- Areas with low rainfall and high temperatures e .g. the desert and semi – desert areas have low population distribution because it does not favor crop farming therefore discourage settlements.

Other factors that influence population distribution

Physical factors

Vegetation cover:

- the dense tropical rainfall regions discourages settlement;
- the savannah grassland areas encourage moderate settlement because it is suitable for animal grazing and it is easy to clear and cultivate crops;
- arid area with no vegetation cover discourage settlement because they do not support growth of plants either..

Altitude / relief

- very high altitude areas of over 3000mabove sea level discourages settlement due to steep slopes / rugged terrain with very low temperatures, low oxygen e.g. the tops of the mountains e.g. Kenya , Kilimanjaro, Rwenzori, Drakensberg;
- areas with moderate altitude receive high rainfall which favors crop farming e.g. the slopes of Mount Kenya, Kilimanjaro, Ethiopian high lands and gently sloping areas e.g. the Nile valley of Egypt, the Jos plateau or Nigeria etc.
- Very low altitude areas e.g. the rift valley floor receive low rainfall and low population distribution

Soils

- Areas of high soil production or fertility have large population e.g. the shores of lake Victoria., the volcanic highlands of Adamawa, Ethiopia, Kenya, Rwanda, Burundi,

- Low fertility soils e.g. sandy desert soils, the sandy soils in the Sahel etc. support low populations.

Drainage: well drained areas e.g. along the Nile valley of Egypt have large population compared to poorly drained areas e.g. around the Nigeria delta have low population

Pests/ diseases and wild animals have special control on population distribution e.g. tsetse flies in the Miombo wood lands in western Tanzanian has led to low population compared to areas with less pests e.g. South East Nigeria, the Nile valley of Egypt

The effect of natural hazards e.g. landslides along the steep slopes of major highlands, Volcanic eruptions, earth quakes, flooding discourages settlements compared to areas -with less natural disasters.

Human factors

- Historical factors e.g. the effect of slave trade depopulated some areas in central Africa border areas conflicting ethnic groups left no man's lands. The effect of civilization in Egypt helped to increase settlement around the Nile valley of Egypt
- Presence of employment opportunities
- Industries leading large population of the copper beet in Zambia, the Sahara desert, the Witwatersrand in the Republic of South Africa etc. compare to areas without minerals.
- The effort of urbanization / development towns has led to rural urban migration to the major cities e g. Cairo, Lagos, Nairobi, Kinshasa, and Johannesburg e.t c.as compared to rural areas without towns.
- The government policy can encourage or discourage through allocation of administrative centers, irrigation schemes e.g. in the Kano plains of Kenya ,the Gezira irrigation scheme in Sudan etc. it can discourage by gazette some areas ; national parks e.g. Tzepo in Kenya, Serengeti national park in Tanzania., national forest reserves ·
- The effect of transport and communication facilities. Areas with sound transport facilities e.g. the wit waters and in South Africa. The TANZAM railway line etc. have attract large populations compared to areas with poor transport network. .
- Strategic locations e.g. along the coastal areas promotes trade, and have attracted large population densities compared to the interior counter parts.
- Political climate i e. Stability and instability. Politically stable areas have attracted large populations e.g. South East Nigeria as opposed the Northern areas of Nigeria, Somalis etc. which arc unstable.
- Cultural factors help to gravitate settlements around the tribal groups. ,
- The effort of trade and commerce. Areas with better opportunities for trade have attracted large populations as opposed to areas with limited trade opportunities.

2. Examine the causes and effects of population explosion in either India or *(25 marks)*

***(Candidate should define population explosion and identify causes and effects in the selected** country.)*

Solution

Population explosion is sudden increase in the number of people in a given area Its characterized by Sudden fall in the resources available per individual within the population. It increases competition for resources within a country

Nigeria currently has a population of about 180 million. Majority of the population below 40years

India currently has a total population above I .3 billion people

Causes of population explosion

- Polygamy practices by Muslims in Nigeria who are religiously accepted to marry up to four wives has led to an increase in the population in Nigeria since each woman or wife produces usually on a competition basis of who will give birth to mote children hence the number of children has drastically increased.

- Reduced infant mortality rate rates due to improved medical services such as immunization against killer diseases like measles, diphtheria, polio; tetanus which used to kill many of the infants has led to increase in population Nigeria.
- High fertility rate among Nigerian women and men leading to more births have led to increase in population
- Low levels of education with a high illiteracy rate results into an increase in population because the less educated people tend to produce more children at an early age, have limited knowledge about family
- planning all of which raise the chances of having many children.
- Limited family planning education and facilities both countries has resulted into increase in population rates. The limited use of contraceptives, condoms and other family control procedures has resulted into many pregnancies whenever intercourse is done.
- Reduced maternal mortality rate due to better health care such as antenatal care.
- Government policy that encourages high population growth to develop a strong market base for agricultural and industrial goods.
- Increased life expectancy due to improved medical facilities
- Immigration especially in Nigeria
- Poverty among the rural people because they lack ambitions, ideal and have enough time at their spouse doing nothing
- Political stability

Effects of high population are both positive and negative

Positive effects/contribution of high population

- High population provides local market to agriculture and industrial output.
- The big population is a source of cheap labour necessary development of the agricultural and industrial sectors.
- High population is a source of government revenue through taxes on their labour.
- High population provides security such as in army, police, prison officers
- High population lead to exploitation of resources in agriculture, fishery, industries etc.

- Negative
- Dependency burdens due to a high number of young people and the elderly who are not productive.
- High populations have strained social facilities like schools, Hospitals in Mumbai, leading to compromised standard of living.
- It has resulted into high cost of living in terms of accommodation, education, health care, feedings in
- It has resulted into poor sanitation in the congested cities such as Mumbai, New Delhi and Calcutta due to abundant domestic waste.
- It has resulted into an increase in the crime rate such as human organ trafficking, drug abuse, theft, etc.
- High population causes unemployment due to many people chasing the few existing jobs.
- High population leads insecurity and unrest due to competition for limited resources.
- High population results into food scarcity and malnutrition.
- High population promotes spreading diseases
- High population has led to land shortage, and environmental degradation.
- Increased government expenditure on social service
- High population in India has led to dependence on foreign aid from the developed countries such as U.S.A. and loans from the World Bank for infrastructural development and sustenance of the government thus slowing down development

3. Examine the factors that have influenced the distribution of population in either Egypt or China. (25 marks)

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(The candidate is expected to give a clear explanation of the factors that have influenced the distribution of population in either Egypt or china. *A candidate should select one country.)*

1. ***A single factor can be used to show how it encourages population distribution and how it discourages population distribution so as to bring out the influence.***

Egypt.

Population is concentrated in the following areas:
Along the Nile valley.
Along the Nile Delta.
Urban centres along the Mediterranean coast.
Some areas on the shores of the red sea
The Sahara desert Oases.
These areas have population density which is between 200 -500 persons per km^2 and even over for some areas.
The rest of the areas are sparsely populated as they are covered by the Sahara desert.

China.

The highest concentration of people is in Eastern China with a density which is over 200 persons per km^2.
Moderate population is in the Southern areas and Central regions with a population density of 50-100 persons per km^2.
Sparse population is found in Northern and Western parts of the Country where the density is below 20 persons per km^2

Factors that have influenced the distribution of population in either Egypt or China are similar

Physical factors

Altitude / relief

- very high altitude areas of over 3000mabove sea level discourages settlement due to steep slopes / rugged terrain with very low temperatures, low oxygen e.g. the tops of the mountains
- areas with moderate altitude receive high rainfall which favors crop farming the Nile valley of Egypt.
- Very low altitude areas e.g. the rift valley floor receive low rainfall and low population distribution

Soils

- Soil fertility g. fertile alluvial soils along the Nile basin promote agriculture and high population density
- Favorable climate for instance the Mediterranean coast of Egypt is cool leading to high population density while the hot and dry tropical Sahara Desert is sparsely populated.
- Well drained places like Nile basin attract high population.

Drainage: well drained areas e.g. along the Nile valley of Egypt have large population compared to poorly drained areas.

Pests/ diseases and wild animals have special control on population distribution e.g. tsetse flies in the Miombo wood lands in western Tanzanian has led to low population compared to areas with less pests e.g. South East Nigeria, the Nile valley of Egypt

Vegetation cover:

- the dense tropical rainfall regions discourages settlement;
- the savannah grassland areas encourage moderate settlement because it is suitable for animal grazing and it is easy to clear and cultivate crops;
- arid area with no vegetation cover discourage settlement because they do not support growth of plants either..

- **The effect of natural hazards**g. landslides along the steep slopes of major highlands, Volcanic eruptions, earth quakes, flooding discourages settlements compared to areas -with less natural disasters.

Human factors

- Historical factors the effect of civilization in Egypt helped to increase settlement around the Nile valley of Egypt
- Presence of employment opportunities
- Presence of minerals attract high population to the mining activities
- Urban centres such as Cairo, Beijing have high population due to rural-urban migration.
- The government policy can encourage or discourage through allocation of irrigation schemes, administration centers encourage high population while allocation of forest reserves and game parks discourage accumulation of population.
- Accessibility of areas encourage high population while remoteness discourages high population
- Presence of social services encourages growth of high population.
- The effort of trade and commerce. Areas with better opportunities for trade such as urban centres have attracted large populations as opposed to areas with limited trade opportunities.
- In-migration lead to increased population while out-migration reduces population growth.

4. (a) Differentiate between in-migration and out- migration (5marks)

In-migration is the temporary/permanent movement of people to an area
Out-migration is the temporary/permanent movement of people out an area
(b) Describe the steps being taken to solve the problems of rural-urban migration in tropical Africa. (20marks)

- Provision of social services to the village such as schools and healthy facilities
- Rural electrification to encourage development of industries and employment in the rural area.
- Improvement of water supply in rural area
- Improvement of security to the rural areas
- Political stability
- Extension of affordable credit facilities into rural areas
- Population control
- Decentralization of government department in order to create employment in the rural areas.
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5. To what extent have physical factors influenced the distribution of population in either Nigeria or China. (25marks)

(A candidate should select one country and then describe the physical factors that influence population distribution, and then evaluate the question by describing other factors

Factors that have influenced the distribution of population in either Egypt or China are similar

Physical factors

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Geography (UACE 250/2) paper 2 section A revision questions

1. Study the table below showing the area under forest in selected countries in Africa (2010) and answer the questions that follow

Country	Total forested area (km^2)	Total land area (km^2)
Algeria	14,920	2,381,741
Nigeria	90,410	923,768
Morocco	51,319	446,550
Mali	124,900	1,240,000
Cote d'Ivoire	104,030	322,463
Niger	12,040	1,267,000

Adapted: 2010 World Development Indicators, World Bank, Washington D.C. pp1-9
Viacmillan Uganda Secondary School Atlas Pp 114
Using the baseline map provided
(a) Draw super-imposed proportional squares to represent the information in the table above (12marks)
(b) Outline the advantages and disadvantages of using the statistical method in (a) above (05marks)
(c) Describe the conditions which have favored the development of the forestry industry in either Algeria or Cote d'Ivoire.

Baseline map of selected countries of Africa

Possible answers
(a) Draw super-imposed proportional squares to represent the information in the table above (12marks)
The candidates are expected to draw super imposed proportional squareson the basemap provided to show total forested area (km2) vis-à-vis total land area(km2) for each of theselected country in Africa.
Procedure

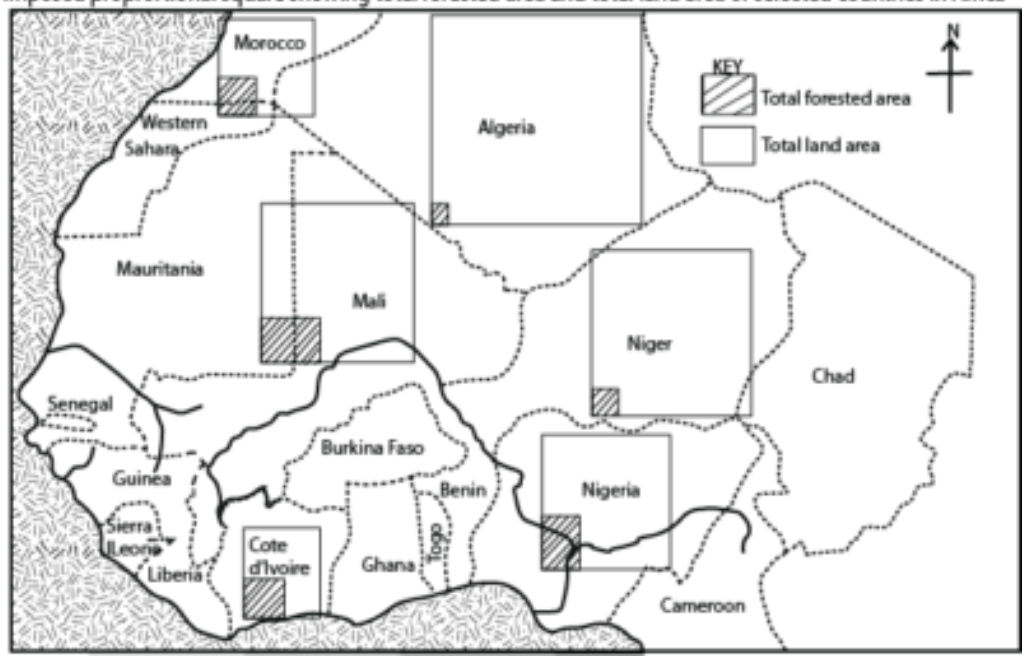
POPULATION REVISION WORK (NYCS)

Find the length of reprensention squares of total land and total forested area of each country by finding the squared root of the respective area divided by the scale

Assuming the scale 1cm:300 units

Country	Forested area	Total land area
Algeria	$\frac{\sqrt{14,920}}{300} = \frac{122.1}{300} = 0.4cm$	$\frac{\sqrt{2,381,741}}{300} = \frac{1543.3}{300} = 5.1cm$
Nigeria	$\frac{\sqrt{90,410}}{300} = \frac{300.6}{300} = 1.0cm$	$\frac{\sqrt{923,768}}{300} = \frac{961}{300} = 3.2cm$
Morocco	$\frac{\sqrt{51,310}}{300} = \frac{226.5}{300} = 0.8cm$	$\frac{\sqrt{446,550}}{300} = \frac{668.2}{300} = 2.2cm$
Mali	$\frac{\sqrt{124,900}}{300} = \frac{353.4}{300} = 1.2cm$	$\frac{\sqrt{1,240,000}}{300} = \frac{1113.5}{300} = 3.7cm$
Cote d'Ivoire	$\frac{\sqrt{104,030}}{300} = \frac{322.5}{300} = 1.1cm$	$\frac{\sqrt{322,463}}{300} = \frac{567.8}{300} = 1.9cm$
Niger	$\frac{\sqrt{12,040}}{300} = \frac{109.}{300} = 0.4cm$	$\frac{\sqrt{1.267,000}}{300} = \frac{1,125.6}{300} = 3.8cm$

Imposed proprortional square showing total forested area and total land area of selected countries in Africa



(b) **Advantages of the method**

- Is easy to interpret
- It is used for comparison
- It has good visual impression
- It can be imposed on maps
- It shows variety of information
- It is easy to draw.

Disadvantages include

- Itinvolves tedious calculations
- It does not show absolute values
- Appears conjested
- Time consuming
- The conditions for growth of forestry industry are more or ess similar in both countriries

Cote d'Ivoire

- Equatorial climate characterized by hot temperature of about24^{0}C and wet conditions i.e. heavy and well distributed rainfall of over 1500mm favor growth of forests

- Fairly fertile soils that favor the quick growth of forests especially in the southern region and around Gagnoa and Divo.
- Fairly low altitudein much of the country that rarely exceeds 200m above sea level favors growth of big trees such as Ebony, mahogany etc.
- The mountainous nature in some areas limits settlement so favors the growth of forests. For example the Toura mountains in the west of Ivory coast.
- Existence of numerous rivers for floating and transporting logs. E.g. R. Sassandra, R. Cavafia, R. Komoe and R. Bandama.
- Developed coastal ports such as Sassandra, San Pedro and Abidjan handle forestry exports such as timber.
- Existence of a variety of commercial tree species such as Mahogany, Ebony, Iroko, Idigbo that command high prices on the world market.
- Existence of capital to inject in the forestry industry. Such capital come from the state and foreign French companies.
- There is relatively a big local market for forestry products and ready market form France, Malaysia, India and Japan.
- Modern technology in form of tractors, diesel saws and chainsawa are used to exploit the forest cheaply and efficiently.
- Presence of both skilled and semi-skilled labour. Skilled labour is provided by the French, malaysian and Chinese workers whille the semi-skilled labour is provided by the locals that do manual work like chopping of leaves and transportation of logs.
- Relative political stability favoring foreign investment in forest industries
- Supportive government policy e.g. afforestation and re-afforestation in south-west.
- Presence of developed roads and railways for cheap transport of forest products
- Presence of vast land where forests grow
- Intensive research to develop industry by the cote d'Ivoire forestry Authority
- Presence of cheap energy generated by R. Bandama and Sassandra for processing of products from trees.

2. Study the table below showing Nigeria's population structure and answer the questions that follow;

Table showing Nigeria's population in millions (2012)

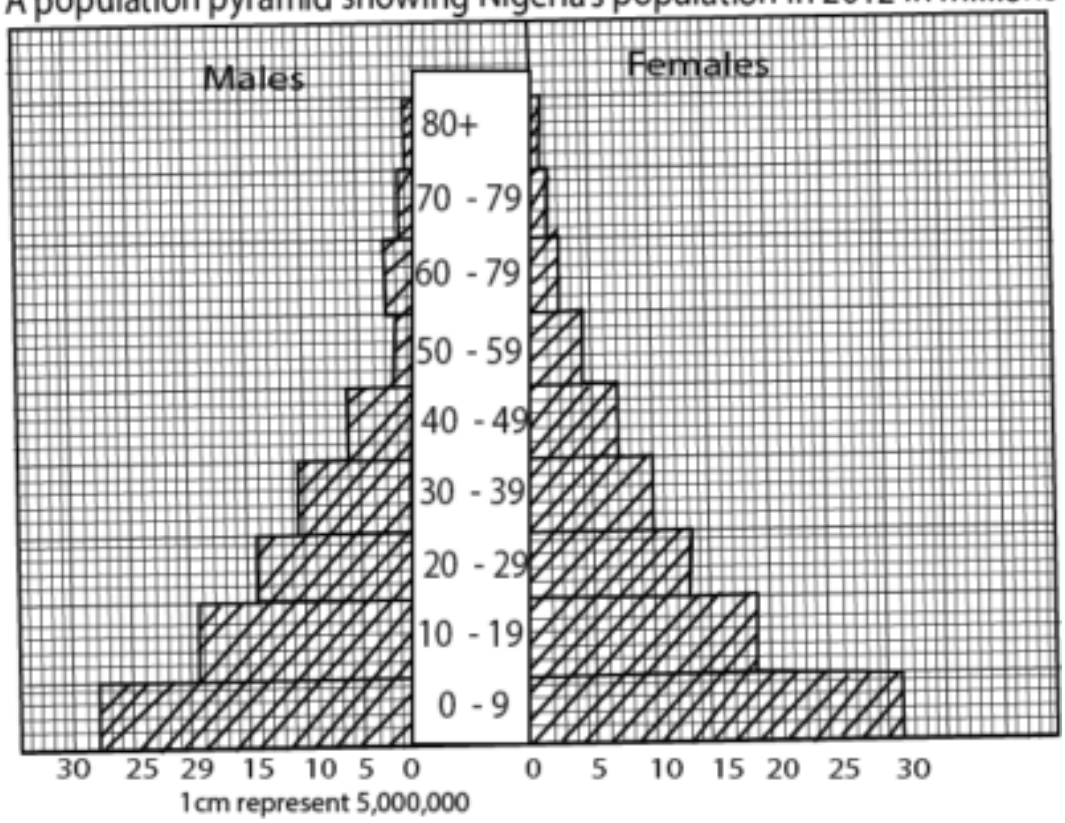
Age group	Males	Females
80+	0.5	0.5
70 – 79	1.2	1.3
60 – 69	2.6	2.6
50 – 59	2.3	4.0
40 – 49	6.6	6.8
30 – 39	10.3	10.1
20 – 29	14.6	13.9
10 – 19	19.5	18.6
0 – 9	27.6	26.1

Adapted: Index Mundi, com/nigeria. age-structure.htm CIA World Bank Factbook, as of February 21, 2013

(a) Draw a population pyramid to represent the information given in the table (10 marks)

(The candidates are expected to draw population pyramid to represent population (2012) in millions)

A population pyramid showing Nigeria's population in 2012 in millions



(b) Outline the merits of using the statistical method in (a) above (03marks)

- It has good visual impression
- It is easy to interpret
- It used for comparision purpose
- It is easy to draw
- It doesn't involve calculation
- It can be superimposed
- It shows varying information (versatile)

(c) Describe the structure of Nigeria's population in 2012 (04marks)

- It has a wider base/it has a large population of young people
- It has a narrow top/it has a small aged population
- Age groups 0 – 39 years has more males than females in Nigeria's population
- Age groups (50- 59) and (0 – 79) has more females than males
- Age groups (50 – 69) and 80+ have the same number of males and females
- It has few old dependents
- It exhibits low life expectancy

(d) Explain the implication of such a population structure on the development of Nigeria. (08marks)

Positive implication

- Provision of labour
- Provision of market
- Provision of security
- Provision of revenue
- The young popuation encourages creativity and innovation
- Enhance provision of social services
- Encourages utilization of resources
- Leads to development of urban centres.

Negative implication

- High dependence ratio
- Strain social services

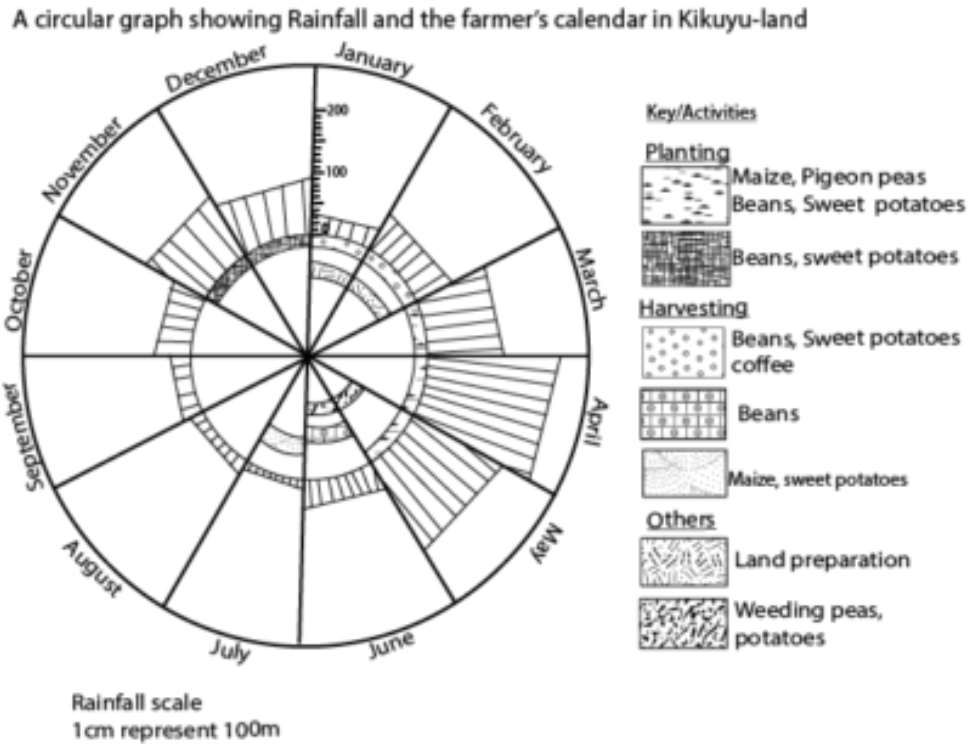
- Food shortage/hunger
- Inadequate accommodation
- Unemployment
- Increased crime rate
- Shortage of land/land fragmentation
- Over utilization of resources/encroachment on environment
- Pollution
- Increased rural urban migration
- Brain drainage
- Over crowding
- Easy spread of diseases
- Insecurity/unrest
- Immorality/juvenile delinquency
- Cultural erosion
- High expenditure on social services.

3. Study the table below showing the farmers' calendar in Kikuyu-land, east Africa and answer the questions that follow:

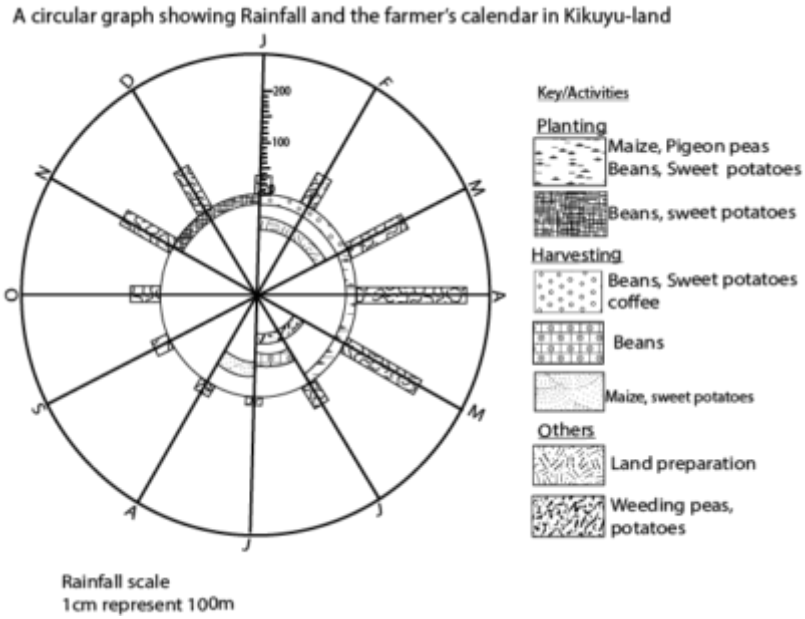
Months	Rainfall (mm)	Planting	Harvesting	othera
J	38		Bean	
F	64		Sweet potatoes coffee	Land preparation
M	125	Maize		
A	211	Pigeon peas		
M	158	Beans Sweet potatoes		Weeding Peas potatoes
J	46		Beans	
J	15		Maize Sweet potatoes	
A	25			
S	31			
O	53			
N	109	Beans		
D	86	Sweet potatoes		

Adapted. Hickman G. at al (1995) Lands and peoples of East Africa: Longman P 72

(a) Draw a circular graph to represent the information in the table above (10marks)



Or



(b) Outline

(i) Merits (02marks)

- It is easy to draw
- It is easy to interpret
- It has good impression
- It shows a variety of information
- It is used for comparison purpose
- It can be superimposed
- Cyclic nature portray continuity
- It requires no calculations

(ii) Demerits of using the statistical method in (a) above(02marks)

- It tedious
- It appears congested
- Occupies a big space
- Cyclic bars are not easy to draw

- Wide amplitude makes it difficult to derive the scale

(c) Explain the relationship between rainfall and farming activities in Kikuyu-land (08marks)

- During the dry season/low rainfall period, harvesting of beans, sweet potatoes and coffee take place.
- The dry season/low rainfall period is used for planting of maize, pigeon peas, beans and sweet potatoes
- The wet season/rainy season influence the weeding activity
- The wet/rainy season is for planting of Beans and sweet potatoes

(d) Suggest measure that should be taken to improve farming activities in Kikuyu land (03marks)
Measures suggested as to improve farming activities in Kikuyu-land are

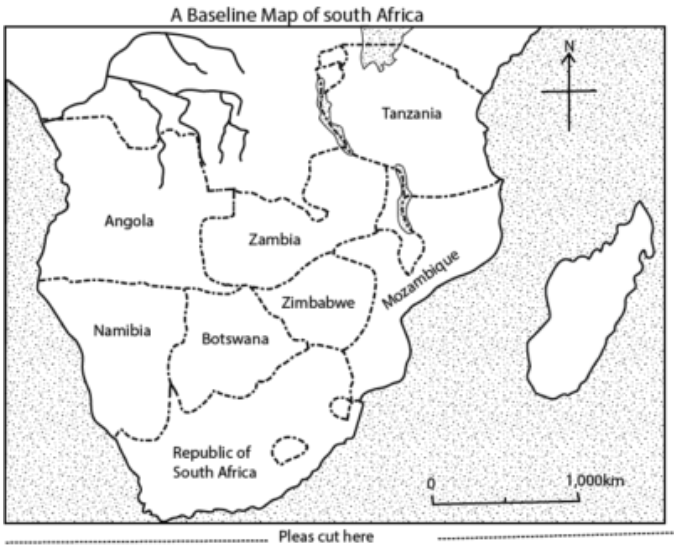
- To use sprying methods
- Use irrigation methods to boost farming
- To research and get resistant and high yield crops
- Obtaining agricultural loans to expand their farms
- Imparting new agrictural skills to their labourers
- Crop rotation to conserve their soils
- Improve transport and communication in order to reach their market easily and cheaply
- To carry out market research for their produce.
- Use improved technology
- Setting up co-operatives to buy and market produce
- Carry out land reforms.

4. Study the table below showing area under forest cover for selected countries in south Africa (2010) and answer the questions that folow

Country	Forested area (km^2)
Botswana	113,510
Malawi	32,370
Mozambique	390,220
Namibia	72,900
South Africa	56,660
Zambia	494,680

Adapted:2010 World Development Indicators, world Bank, Washington D.C Pp1-9; Macmillan Uganda Secondary school Atlas Pp 114

(a) Using the baseline map of south Africa provided, draw proportional circles to represent the information in the table above (10 marks)
(b) Outline the merits and demerits of using the above method (07marks)
(c) Account for the development of the forestry industry in any one country given in the table . (08marks)



Solution

(a) Candidates are expected to calculate the radius using a common scale so as to draw proportional circles on the baseline map of south Africa.

Note we consider two approaches for finding the radius

Approach 1: Using the square root approach, i.e. radius = linear scale factor = $\sqrt{area\ scale\ factor}$.

When the values of the radius obtained are too big to fit on the paper, appropriate scale is used.

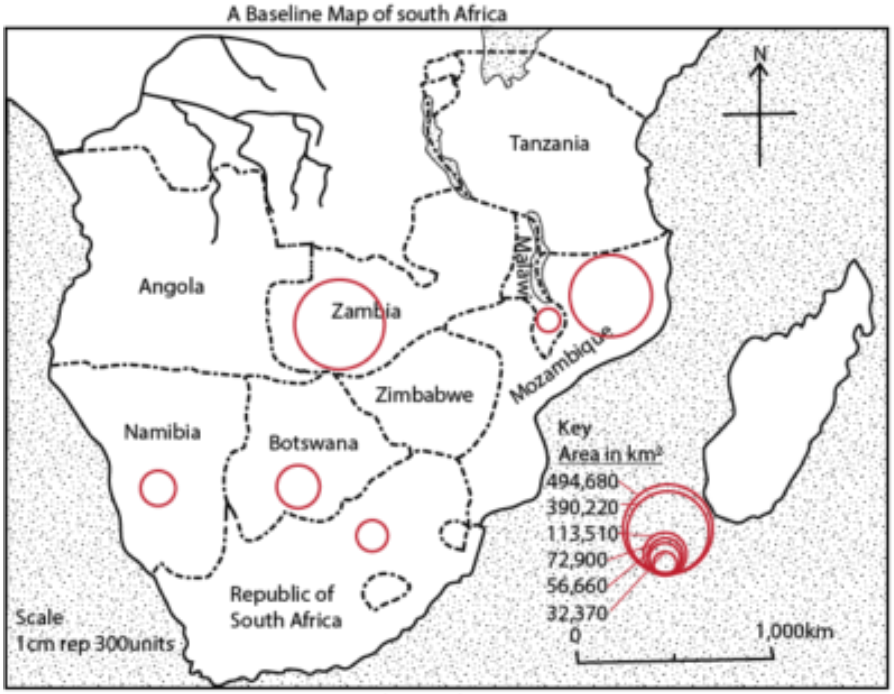
Country	Calculated radius	Scaled down radius
Botswana	$\sqrt{113{,}510} = 336.9$	$\frac{336.9}{300} = 1.1cm$
Malawi	$\sqrt{32{,}370} = 179.9$	$\frac{179.9}{300} = 0.6cm$
Mozambique	$\sqrt{390{,}220} = 624.7$	$\frac{624.7}{300} = 2.1cm$
Namibia	$\sqrt{72{,}900} = 270$	$\frac{270}{300} = 0.9cm$
South africa	$\sqrt{56{,}660} = 238$	$\frac{238}{300} = 0.8cm$
Zambia	$\sqrt{494{,}680} = 703.3$	$\frac{703.3}{300} = 2.3cm$

Note: Assumed scale- 1cm represent 300units

POPULATION REVISION WORK (NYCS)

Proportional circles showing area under forest cover for the selected countries of southern Africa

A Baseline Map of south Africa



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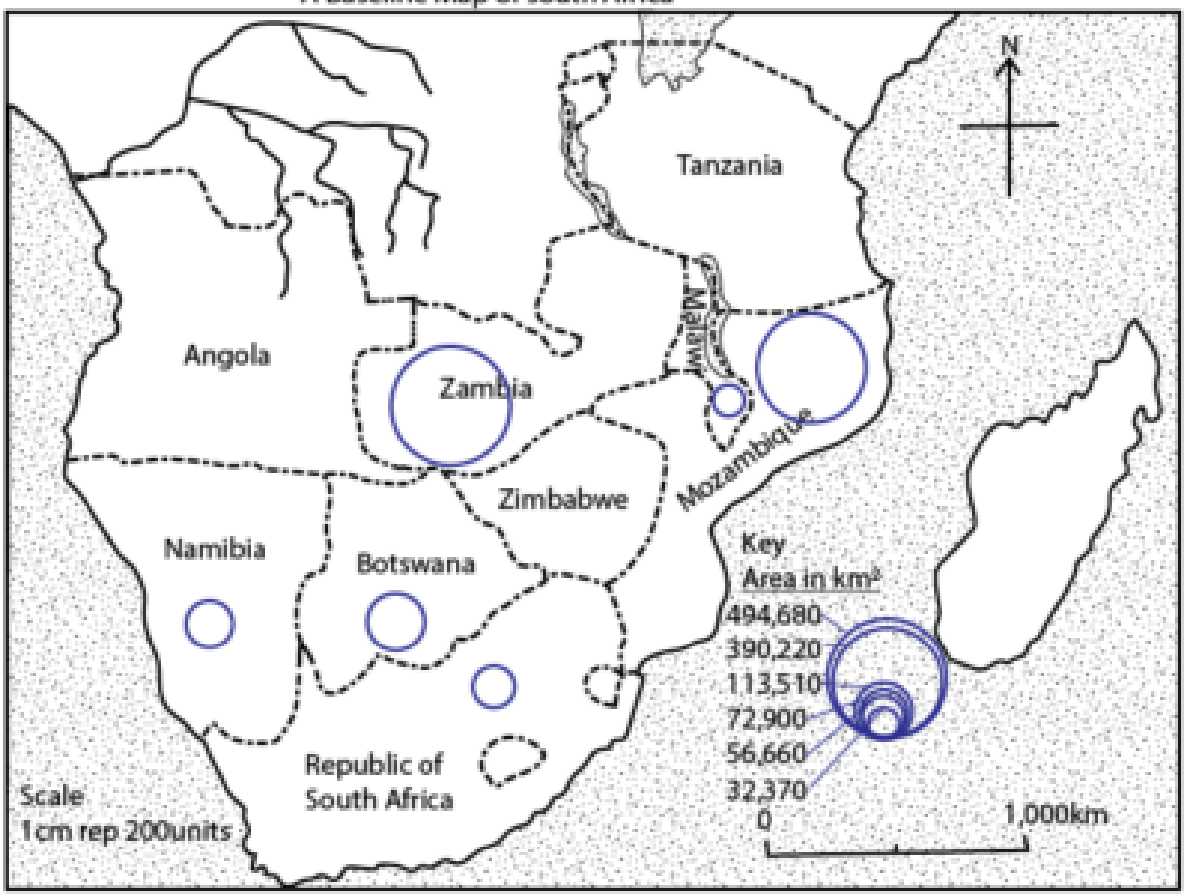
Approach 2: Using the general formula for the area of cirle i.e Area = πr^2 and r = $\sqrt{\frac{Area}{\pi}}$

Country	Calaculated radius	Scaled down radius
Botswana	$\sqrt{\frac{113,510}{3.14}} = 190.1$	$\frac{190.1}{200} = 1.0cm$
Malawi	$\sqrt{\frac{32,370}{3.14}} = 101.5$	$\frac{101.5}{200} = 0.5cm$
Mozambique	$\sqrt{\frac{390,220}{3.14}} = 352.5$	$\frac{352.5}{200} = 1.8cm$
Namibia	$\sqrt{\frac{72,900}{3.14}} = 152.3$	$\frac{152.3}{200} = 0.8cm$
South africa	$\sqrt{\frac{56,660}{3.14}} = 134.3$	$\frac{134.3}{200} = 0.7cm$
Zambia	$\sqrt{\frac{494,680}{3.14}} = 397$	$\frac{397}{200} = 2.0cm$

Note: Assumed scale- 1cm represent 200units

Proportional circles showing area under forest cover for the selected countries of southern Africa

A Baseline Map of south Africa



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(b) (i) Merits of the method

- It is easy to draw
- It is for comparison purpose
- It is easy to interpret
- Used to show variety of information
- It has good visual impression
- Superimposing is possible

(ii) Demerits of the method

- It involves lengthy calculation
- It appears congested
- It is tedious
- May not show absolute figures
- It consume space
- Difficult to find suitable scale

(c) The candidate must state one country from the table and account for the development of the forestry industry. NB. The factors are more or less similar. These include among others:

- Favorable climate conditions
- Altitude
- Drainage/water supply
- Fertile soils
- Presence of vast land for growth of forests
- Presence of commercial tree species
- Presence of labour
- High level of technology
- Research

- Availabiity of adequate capital
- Presence of transport means
- Availability of market
- Presence of power
- Political stability
- Favorable government policy.

These outlined poits need explanation in order to earn marks.

5. Study the table showing rooad and railway transport in selelcted African countries (2000-2005) and answer the qustions that follow

Country	Road network (km)	Railway network
Nigeria	193,200	3,528
Botswana	24,455	888
Cote d'Ivoire	80,000	639
Dr Congo	153,497	3,641
Ghana	47,787	977
Zambia	91,440	1,273
Total	590,379	10,946

Adapted: 200 World Development Indicators: World Bank, African Database p 72

(a) Draw combined proportional divided semi-circle to represent the information given in the table (12marks)

(b) Outline the demerits of using the statistical method in (a) above (05marks)

(c) Identify the country with the longest:

(i) Road network (01mark)

(ii) Railway network (01mark)

(d) Account for the development of the transport sector in any one country identified in (c) above.

Solution

The radius of each of the semi-circles is obtained by calculating the square root of the total road and railway distances.

Road network

$r = \sqrt{590,379} = 768$

Scale let 1cm represent 100km

$\therefore r = \frac{768}{100} = 7.7cm$

Railway network

$r = \sqrt{10,946} = 105$

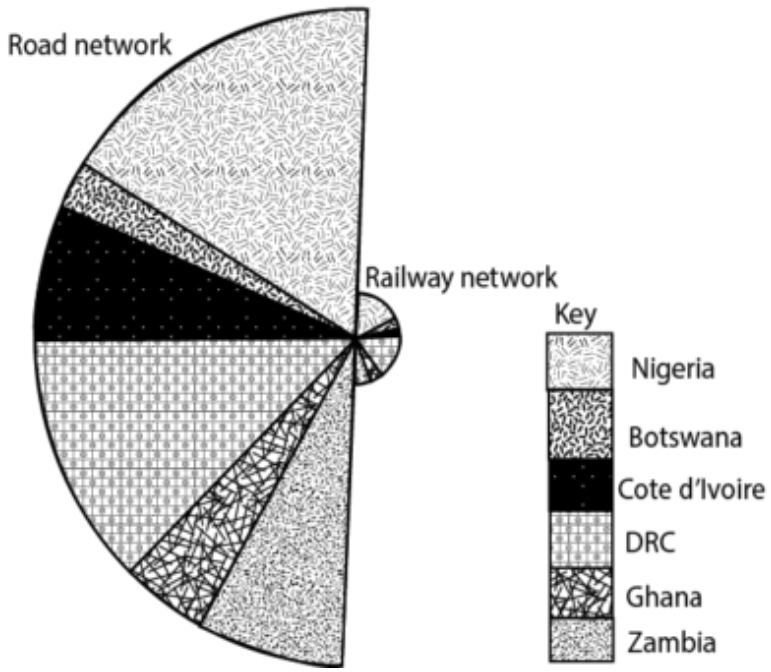
Scale let 1cm represent 100km

$\therefore r = \frac{105}{100} = 1.1cm$

Representative degrees for the transport network of each country

Country	Road network (degrees)	Railway network
Nigeria	$\frac{193,200}{590379} x\ 180 = 58.9^0$	$\frac{3,528}{10,946} x\ 180 = 58^0$
Botswana	$\frac{24,455}{590379} x\ 180 = 7.5^0$	$\frac{888}{10,946} x\ 180 = 14.6^0$
Cote d'Ivoire	$\frac{80,000}{590379} x\ 180 = 24.4^0$	$\frac{639}{10,946} x\ 180 = 10.5^0$
Dr Congo	$\frac{153,497}{590379} x\ 180 = 46.8^0$	$\frac{3,641}{10,946} x\ 180 = 59.9^0$
Ghana	$\frac{47,787}{590379} x\ 180 = 14.6^0$	$\frac{977}{10,946} x\ 180 = 16^0$
Zambia	$\frac{91,440}{590379} x\ 180 = 27.9^0$	$\frac{1,273}{10,946} x\ 180 = 20.9^0$
Total	590,379	10,946

A combined proportional divided semi-circles showing road and railway transport network in selected African countries (2000-2005)



Or

Road network $\pi r^2 = 590379$ railway network $\pi r^2 = 10,946$

Area = total distance $3.14r^2 = 590379$ Area = total distance $3.16r^2 = 10,946$

$r = \sqrt{\frac{590379}{3.14}} = 433.6$

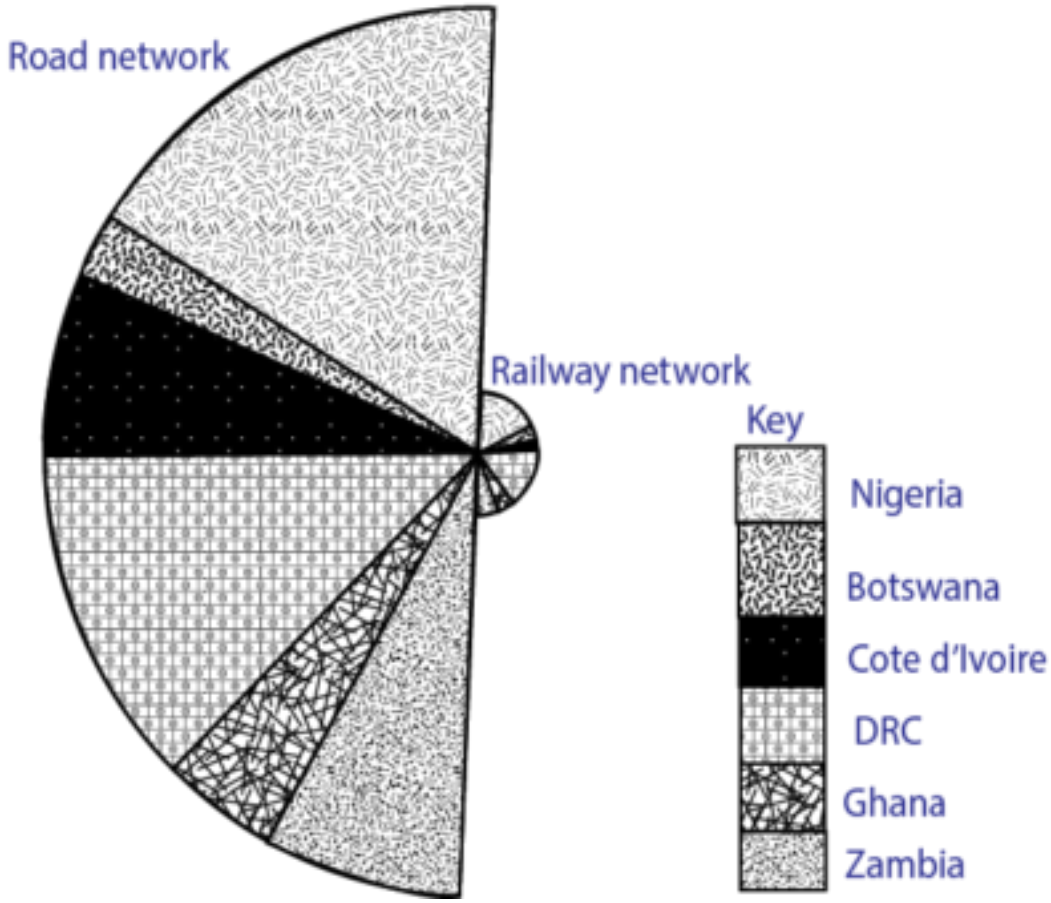
$r = \sqrt{\frac{10,946}{3.14}} = 59$

1cm represent 100 units

$\therefore r = \frac{433.6}{100} = 4.4cm$

$\therefore r = \frac{59}{100} = 0.6cm$

A combined proportional divided semi-circles showing road and railway transport network in selected African countries (2000-2005)



(b) Demerits

- Requires tedious calculations
- Drawing consumes time
- It does not show absolute values
- It is difficult to represent small angles
- Not easy to read angles without measurement
- Many variable/items make it congested
- Occupies a large space

(c) country with the longest
(i) road network is Nigeria
(ii) railway network: DRC

(d) Factors for the development of the transport sector in either Nigeria or DRC
They are more or less similar for both countries

- Presence of abundant mineral resources for example gold, tin in Katanga and Kisangani provinces, others are copper, diamond in Kasai region and iron ore that necessitated construction of railway line in the eastern and northern part of DRC.
- Existence of extensive forest resources favored development of the railway transport in order to exploit forest products such as timber
- Presence of rich agricultural inter land with a variety of commodities to be transported along railway line. These included food stuffs like bananas, coffee, bean, livestock, maize, sugar canes etc.

- The gently sloping landscape in the north in Kisangani province and in the eastern Katanga province mat it easy to lay or construct the railway line for use in transportation of people, merchandise and mineral like gold.
- Availability of capital use for railway construction.
- Presence of skilled (from France, Belgium and china), semi-skilled and unskilled labour.
- Presence of improved technology such as use of tractor in clearing land where the lines would pass, use of diesel saws to cut trees, use of crane to lay the railways.
- Large population in interior to provide market for the railway service.
- Favorable government policies for the construction of transport system
- Political stability that allowed for construction of railway lines

6. Study the table provided below showing land area and population size for selected African countries and answer the questions that follow

Country	Land Area ('000s km^2)	Population size ('000s)
Algeria	2,382	30,800
Central African Republic	623	3,800
Chad	1,259	7,900
Djibouni	23	600
Egypt	995	65,200
Ethiopia	1,000	65,800
Libya	1,760	5,400
Morocco	446	29,200
Niger	1,267	11,200
Somalia	627	9,100
Sudan	2,376	31,700
Tunisia	155	9,700

Adapted: 2003 African Development Indicator; World Bank, Washington D.C p5

(a) Calculate the population density for each of the selected countries shown in the table (06marks)

(b) Using the base map provided below, draw a choropleth (density) map to represent the information obtained in (a) above(10 marks)

(c) Outline the demerits of the statistical method used in (b) above (03marks)

(d) Explain the causes of the variation in the population density of the region shown on the base map (06 marks)

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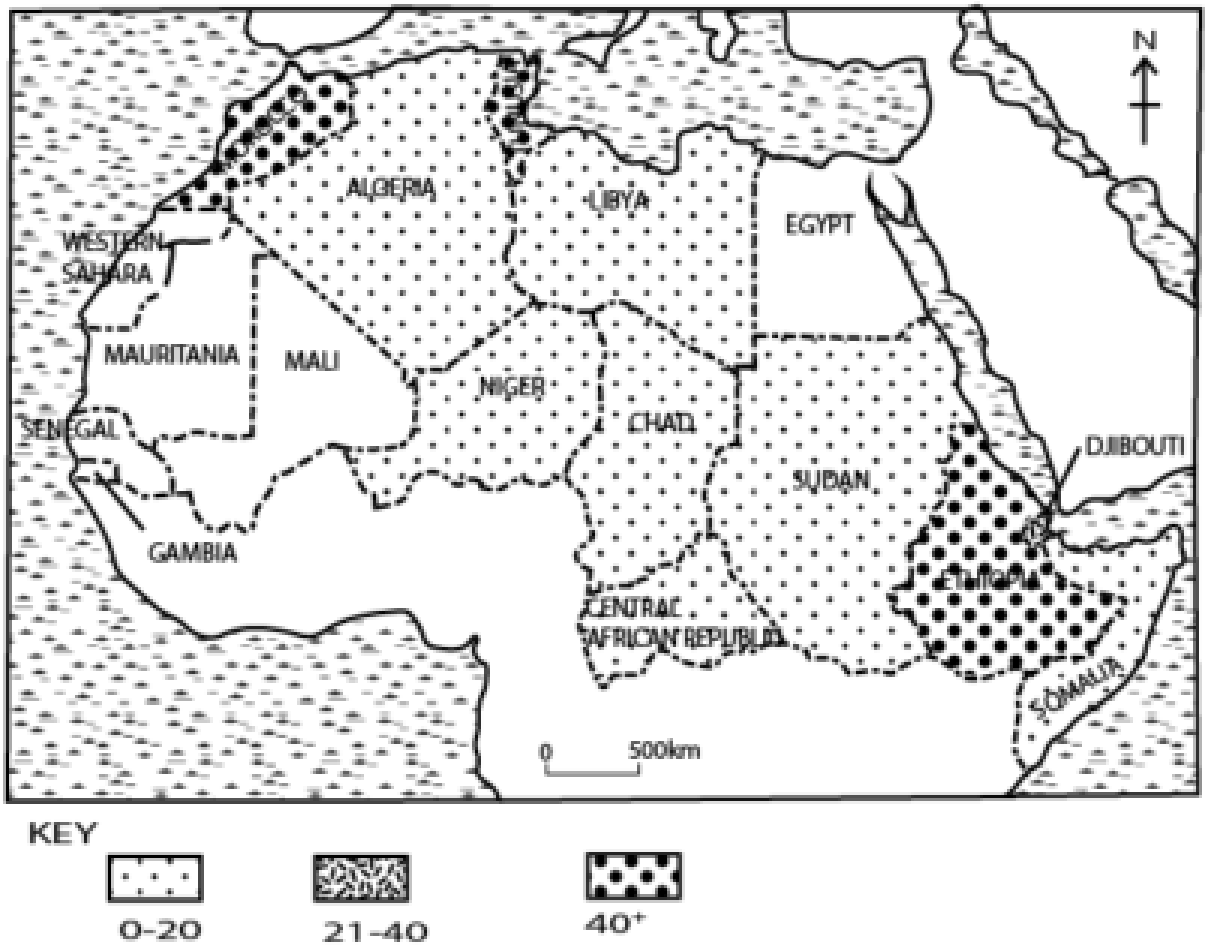
solution

(a) Population density = $\frac{\text{Total population}}{\text{Land area}}$

Country	Population density (persons/sq km)
Algeria	$\frac{30,000,000}{2,382,000} = 12.9$
Central African Republic	$\frac{3,800,000}{623,000} = 6.1$
Chad	$\frac{7,900,000}{1,259,000} = 6.3$
Djibouni	$\frac{600,000}{23,000} = 26.1$
Egypt	$\frac{65,200,000}{995,000} = 65.5$
Ethiopia	$\frac{65,200,000}{1,000,000} = 65.8$
Libya	$\frac{5,400,000}{1,760,000} = 3.1$
Morocco	$\frac{29,200,000}{446,000} = 65.5$
Niger	$\frac{11,200,000}{1,267,000} = 8.8$
Somalia	$\frac{9,100,000}{627,000} = 14.5$
Sudan	$\frac{31,700,000}{2,376,000} = 13.3$
Tunisia	$\frac{9,700,000}{155,000} = 62.6$

(b)

A CHOROPLETH/DENSITY MAP SHOWING POPULATION DENSITY FOR SELECTED AFRICAN COUNTRIES



(c) The demerits/disadvantages of the method used are

- Shading consumes time
- It assumes that the population is uniformly distributed throughout in the area and throughout the year.
- The assumes that the population density changes abruptly across the boundaries
- Many grades makes it congested
- Doesn't give actual population figures
- Involves tedious calculations
- Consumes a lot of space

(d) Causes of population variations

- Historical factors for instance depopulation through slavery
- Climatic factors such as heavy rainfall lead to dense population
- Fertie soils lead to heavy population
- Presence vectors/diseases such as tsetse fly lead to low population.
- Presence of minerals that attracts people
- Wild animals may scare away people
- Political atmosphere such as wars in angola lead to sparce population
- Well drained areas attract people while swampy/water ogged areas lead scarce population
- Urbanization such as towns like Pretoria have more settlement
- Relief: gentle slopes usually are densely populated compared steep slopes and deep valleys
- Transport and communication/social services attract big population
- Government policy of directing population through settlement schemes.

1. Candidates should explain the above outlined points with reference to specific examples

7. Study the table below showing land under irrigation for selected countries and answer the questions that follow

Country	Irrigated land percentage of cropland
USA	12.5
Egypt	100
China	35.5
Sudan	10.9
India	32.7
Libya	21.9
Republic of South Africa	9.5

Adapted from 2008: World Development Indicators. The World Bank, Washington D.C Pp 134-136

(a) Draw a divergent bar graph to represent the information given in the table (12marks)

(b) State the disadvantages of using the statistical method in (a) above (03marks)

(c) Explain the conditions which favored irrigation in either USA or the sudan. (10marks)

Possible answers

Total sum = 12.5+ 100+ 35.5 +10.9 + 32.7+21.9 + 9.5 = 223

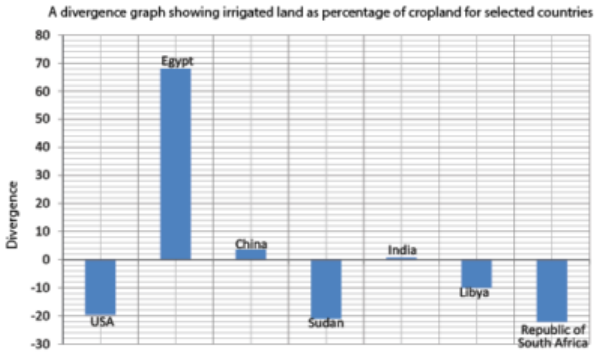
Average = 23/7= 32

Divergence = given value – mean value

For example divergence for USA = 12.5- 32 = -19.5

Table showing divergence

Country	Irrigated land percentage of cropland	divergence
USA	12.5	-19.5
Egypt	100	68
China	35.5	3.5
Sudan	10.9	-21
India	32.7	0.7
Libya	21.9	-10
Republic of South Africa	9.5	-22



(b)Disadvantages of the statistical method above include

- Tedious
- Involve lengthy calculations
- Take a big space
- It is restricted to one purpose
- It does not portray actual values

(c) Candidates must select one country and explain the conditions that have favored irrigation farming

Irrigation farming in USA

The irrigation projects in USA;

- the central valley of California

- Snake river project on the Snake river plains, Phoenix project in Gila river, Columbia basin along Columbia river, Tennessee river project etc.

Factors that have favored irrigation farming in USA

Physical factors

- The arid/ Mediterranean and desert climate in California is characterized by low and unreliable rainfall rarely exceeding 400mm and hot temperatures above 30^0 during summer making agriculture difficult and necessitating irrigation.
- The gently slopping/low land of the central valley, death valley and Yucca valley in the south make irrigation cheap and easy because water freely flows under gravity.
- Availability of permanent water sources for irrigation by R. Sacramento, R. San Joaquin, and delta Mendota canal encourages use of irrigation throughout the year.
- The snowcapped Sierra Nevada Mountains provide a constant supply of melt water to rivers Sacramento, San Joaquin which is stored in Shasta dam and Friant dam and used for irrigation throughout the year.
- Availability of fertile alluvial soils deposited by R. Sacramento, san Joaquin favors growth of crops such as oranges and vegetables.
- Sparse population within California provide extensive land for carrying out irrigation farming.
- The gentle/relatively flat land scape in the ventral and Yucca valley favors mechanization and profitable output
- The Mediterranean/climate characterized by low rainfall and hot temperatures discourage the spread of pests and diseases which would destroy crops.
- The dry climate characterized by hot temperature of up to 30^0C during summer encourages growth and ripening fruits such as oranges, lemon, tomatoes etc.
- Presence of improved/modern/advanced technology for construction of canals and dams that store water for irrigation throughout the year.
- Ready market from the citizens and European countries.
- Availability of capital for construction of canals and dams.
- Presence of Agro processing industries that provide market for the produce.
- Presence of skilled and unskilled labor t work on the irrigational farms
- Political stability that encourages investment in irrigation schemes.
- Supportive government policies to irrigation cooperative , fruit processing industries etc.
- Presence of well developed transport and communication facilities.
- There was a great desire for California to increase food production for ever expanding population.

Irrigation in Sudan

Sudan is generally a dry country and has taken advantage of r. Nile to develop irrigation farming. The major irrigation schemes in Sudan are

- Gezira Scheme on Gezira Plain along R. Nile; it produces cotton, maize, beans, etc.
- Rahad scheme located on River Rahad; produces cotton, ground nuts, vegetables and maize.
- Kanana Scheme located south of the major Gezira scheme for producing sugar canes
- Danszin irrigate ranch producing vegetables, fruits, beans, groundnuts etc.
- Gash Delta Scheme on R. Gash
- Kashm el Girba Scheme along R. Atbar in North-Eastern Sudan.

Factors that favors irrigation farming in Sudan

Physical factors

- The arid climate around the Gezira Scheme is characterized by high temperatures that promote the ripening of fruits.
- The Gezira plains are generally flat favoring mechanization as well as water flow in the irrigation canals enabling large scale farming.

- Pressence of fertile alluvial soils in the Gezira plains deposited by both White and Blue Nile promote growth of a variety of crops
- Availabiity of cheap large tracts of land along Gezira that favor largescale farming.
- Being dry; it lacks vegetation making it easy clear for irrigation farming.
- The gezira plains have a good water table such that water logging does not occur which favors growth of cotton and sugar cane
- Presence of a small population leading availability of land for irrigation farming

Other factors

- The rich history of irrigation in Sudan through use of shadoofs equipped the Sudanese with adequate irrigation skills.
- Presence of abundant skilled cheap labour to clear land for farming
- Availability of capital to set up irrigation scheme with support from UK
- Relative political stability to enable continuity of irrigation and security to protect the irrigation investments.
- The need to create employment opportunities to the people in the Gezira plains and Kordofan region lead to establishment and the success of the Gezira Scheme
- Appropriate research led to the success of the irrigation schemes.

8. Study the table below showing Power and energy source for the selected countries and answer the questions that follow

Country	Energy Production (Billion kWh)	Hydro-electric power (%)	Coal (%)	Oil (%)	Natural gas (%)	Nuclear Power (%)
China	1,350	16.0	78.0	4.0	1.0	1.0
Switzerland	66	56.0	0.0	1.0	2.0	41.0
Egypt	75	18.7	0.0	16.1	65.2	0.0
USA	4,000	6.0	54.0	3.0	17.0	20.0

Adapted: 2003 world Development Indicator; World Bank, Washington, DC pp 151-154.
(a) Draw a compound divided rectangles to represent the information given in the table (10marks)
(b) Outline the advantages and disadvantages of using the statistical method in (a) above. (05marks)
(c) Account for the high energy production in either china or the USA (06marks)
(d) Explain the role of power and energy in the development of any one country given in the table

Solution

(a) A candidate is expected to find the percentages of the total energy consumed by each of the country which are plotted on the horizontal axis,
Total energy = 1,350 + 66 + 75 + 4000 = 5,491 Billion kWh
Percentage of energy consumed by each country

Percentag of energy consumed by each country

China $= \frac{1,350}{5,491} x\ 100 = 24.6\%$

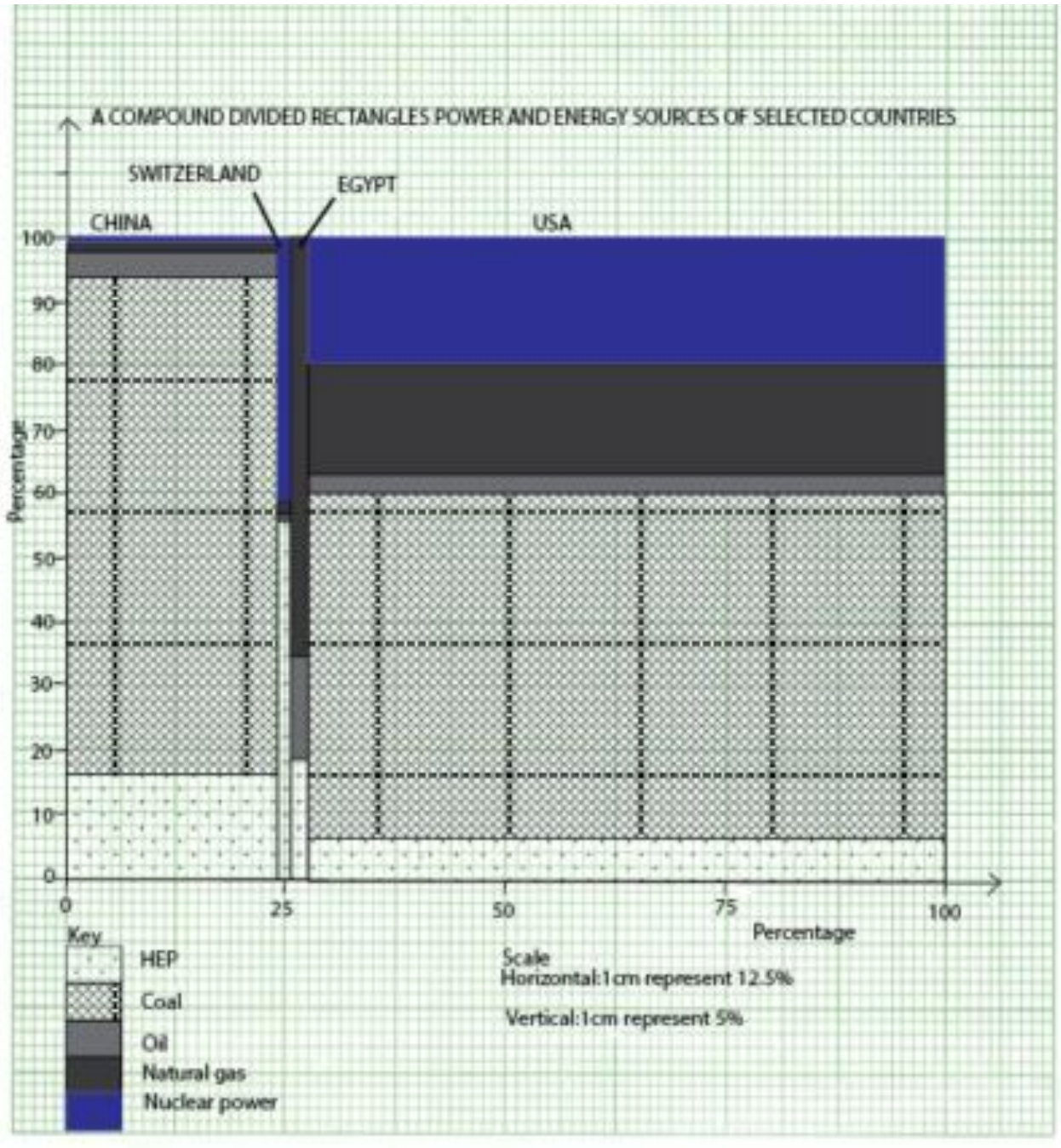
Switzerland $= \frac{66}{5,491} x\ 100 = 1.2\%$

Egypt $= \frac{75}{5,491} x\ 100 = 1.4\%$

USA $= \frac{4,000}{5,491} x\ 100 = 72.8$

Cumulative percentage of energy is plotted on the vertical axis
Table of percentages

Country	HEP (%)	Coal(%)	Oil(%)	Natural gas(%)	Nuclear Power (%)
China	16.0	78.0	4.0	1.0	1.0
Cummulative%	**16.0**	**94**	*98*	**99**	**100**
Switzerland	56.0	0.0	1.0	2.0	41.0
Cummulative%	**56**	**56**	**57**	**59**	**100**
Egypt	18.7	0.0	16.1	65.2	0.0
Cummulative%	18.7	18.7	34.8	100	100
USA	6.0	54.0	3.0	17.0	20.0
Cummulative%	**6.0**	**60.0**	**63.0**	**80.0**	**100**



(b) Advantages of a compound divided rectangle

- Gives a good visual impression
- Easy to read and understand

- Good for comparison purposes
- Can represent many variables/versatile
- Shows two dependent variable
- Does not involve complicated calculations

Disadvantages of a compound divided rectangle

- It occupies a lot of space
- Difficult to read individual component parts since they are cumulative
- Choosing a suitable scale is difficult in case of great variations in values
- Time consuming
- It becomes congested with many variable

(c) A candidate should select one country and give the reasons. These are similar

- Availability/ abundance of power and enough energy sources.
- Market for power or energy in industries
- High level of technology
- Improved research
- Skilled and unskilled labour for power plant construction
- Favorable government policy
- Favorable political climate
- Efficient transport networks
- Availability of capital to buy power generating equipment

(d) Candidates should explain the outlined points giving specific examples

A candidate must name one country and explain the role of power and energy in the development. The reasons are more or less similar. They include

- Diversifies the economy
- Promotes trade cooperation
- Used in improving the transport sector
- Stimulates industrial development
- Leads to urbanization
- Stimulates agriculture production through stimulating agro industries
- Promotes tourism
- Provides employment
- Source of foreign exchange
- Source of government revenue
- Promote research and mineral exploitation
- Increases the index of development

NB. Candidates should explain the outlined points giving specific examples

9. Study the map below showing the mean annual rainfall figures in millilitres for part of west Africa and answer the questions that follow

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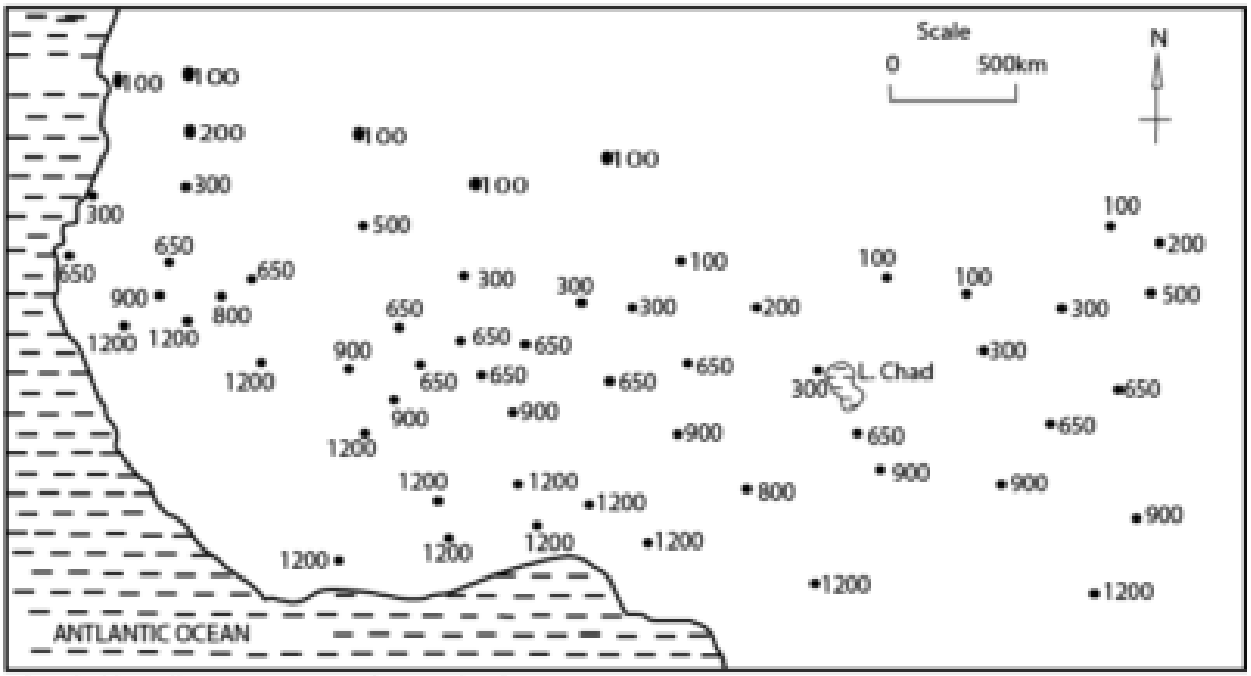
A Sketch map of Annual Rainfall (in mm) for part of West Africa



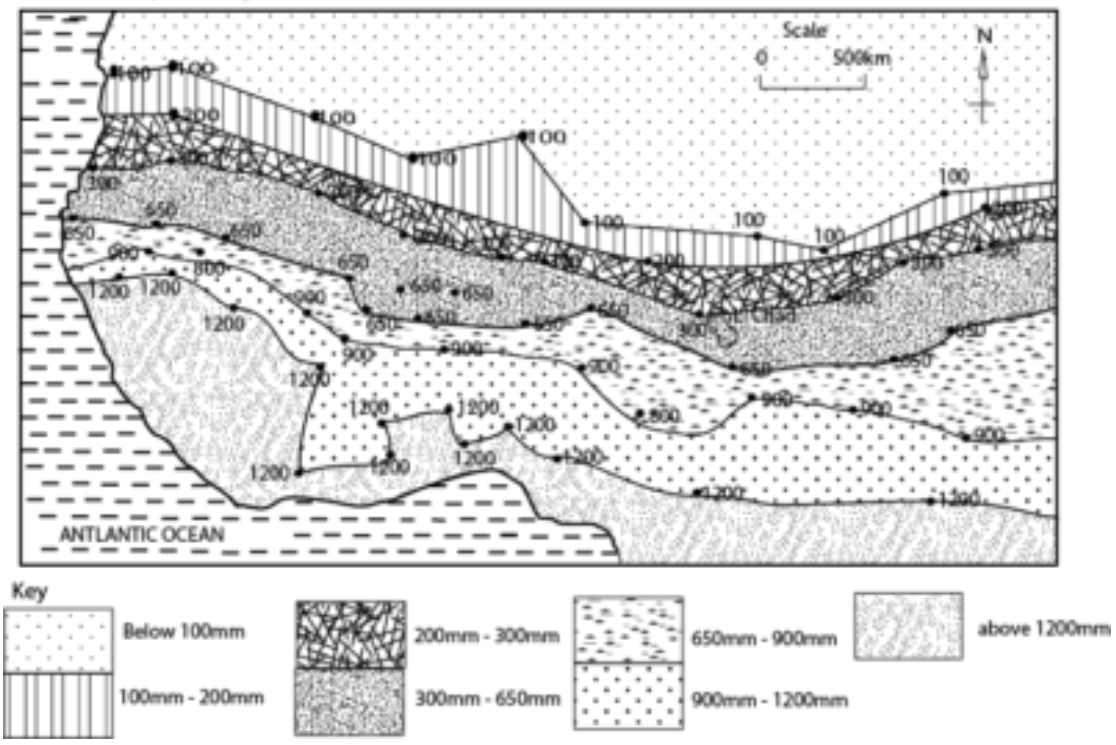
Attach this outline to your answer for question 1

(a) Draw an isoline map showing rainfall distribution for West Africa
(b) Outline the merits of using the statistical method in (a) above
(c) Account for the rainfall distribution shown in the sketch map drawn in (a) above
(d) Explain the influence of rainfall distribution on human activities in the area shown on the sketch map.

Suggested solutions

(a)

An Isoline map showing rainfall distribution for West Africa



(b) Merits

- Good visual impression
- Easy to interpret
- Can be super imposed
- Easy to draw/construct
- Does not involve calculations
- Easy to compare

(c) the rainfall distribution is due to

- Ocean current (Guinea + canary)
- ITCZ/latitudinal location in the equatorial belt
- Continentality/distance from the sea
- Trade winds
- Vegetation
- Relief
- Water bodies
- Man's activities e.g. pastoralism, deforestation

(d) Influence of rainfall to man's activities

Heavy rainfall

- Leads to lumbering due togrowth of (equatorial) forests
- Growing ofperennial crops in south/plantation farming
- Rivers lead fishing, water transport/HEP generation
- Favors settlement
- Favors wildlife hence tourism
- Favors agriculture and hence industrialization and trade.

Lowrainfall

- Favors pastoralism/transhumance
- Encourages irrigation farming
- Favors mining

Study the table below showing the percentage of food output for selected African countries (2002) ad answer the following questions that follow

Country	Land Area ('000km^2)	Crops (% of total output)		
		Maize	Cassava	Bananas
Ghana	228	8.4	75.4	16.2
Gabon	258	5.0	43.7	51.3
DRC	2,267	7.0	89.8	3.2
Tanzania	884	30.7	69.3	00

Adapted; 2003 African Development Indicators; World Bank, Washington, DC (pp. 5; 222-225)

(a) Draw a compound rectangle to portray the information In the table

(b) Outline the merits and demerits of using the method in (a) above

(c) (i) Identify the dominant crop grown in the countries given in the table.

(ii) account for the dominance of the crop identified in (c)(i) above

(d) Explain the contribution of the agricultural sector to the development of any one country given in the table.

Suggested answers

(a) A candidate is expected to find the percentages of the total land consumed by each of the country which are plotted on the horizontal axis,

Total Land = 228+ 258 + 2,267 + 884 = 3637

Percentag of land occupied by each country

Ghana $= \frac{228}{3637} x\ 100 = 6.3\%$

Gabon $= \frac{258}{3637} x\ 100 = 7.1\%$

DRC $= \frac{2,267}{3637} x\ 100 = 62.3\%$

Tanzania $= \frac{884}{3637} x\ 100 = 24.3\%$

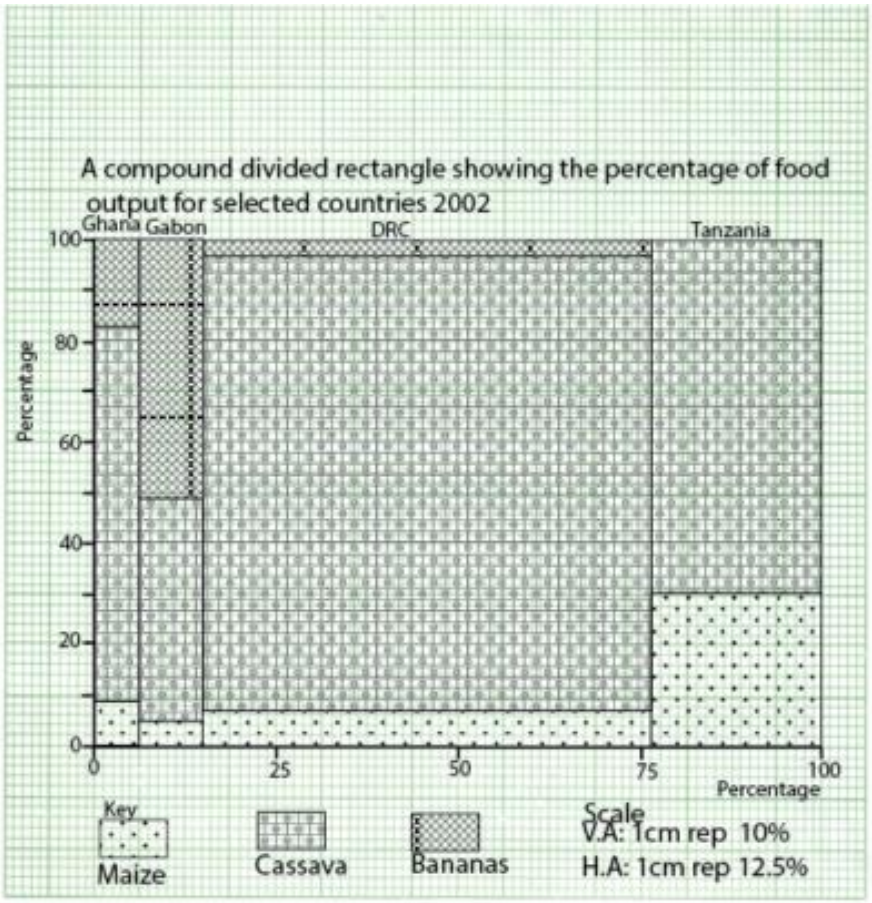
Table of cumulative frequency of percentages of land

Countries	Ghana	Gabon	DRC	Tanzania
Cumulative Frequency	6.3	13.4	75.7	100

Cumulative percentage of crops is plotted on the vertical axis

Table of cumulative percentages of crops

Country	Crops (% of total output)		
	Maize	Cassava	Bananas
Ghana	8.4	75.4	16.2
Cumulative %	**8.4**	**83.8**	**100**
Gabon	5.0	43.7	51.3
Cumulative %	**5.0**	**48.7**	**100**
DRC	7.0	89.8	3.2
Cumulative %	**7.0**	**96.8**	**100**
Tanzania	30.7	69.3	00
Cumulative %	**30.7**	**100**	**100**



(b) Merits include

- Easy to draw/construct
- Easy to interpret
- Easy for comparison
- Can represent many items/variables
- Gives clear visual impression
- Does not involve difficult calculations
- Can be super imposed on other diagrams

Demerits include

Many items/variables make the diagram congested/difficult to interpret

- In case of large amplitude, finding a suitable scale is difficult
- It does not show actual values
- Time consuming
- Occupies large space

(c) (i) Cassava

(ii)

- Easy to grow
- Can tolerate greater variations in climate
- Can grow on variety of soils
- It is resistant to pests and diseases
- It is the main staple food in Africa
- It does not need a lot of care
- It easily stored in dry form
-
- Candidate should select one country and explain its contribution of agriciltural sector to its development, the points are the same

For Ghana

- Source of food for the people
- Source of foreign exchange
- Provides employment to the people
- Provide raw materials to agro industries
- Encourages development of transport network
- Promote trade and cooperation
- Provide education/research grounds
- Diversifies the economy
- Attracts foreign investors.

11. Study the table belowshowing annual average fish Export and Imports in thousands of US $ for selected countries (1998- 2000) and answer the questions that follow

Country	Exports ('000s US $)	Imports ('000s US $)
Angola	10,800	14,300
Ghana	81,100	97,300
Peru	852,200	15,400
Republic of south Africa	259,000	64,100
Sweden	472,000	688,900
Total	1,675,100	880,000

Adapted: world Resources (2002 – 2004): Decissions for the Earth; Balance, Voice and Power: UNDP. UNEP, World Bank & World Resources Institute pp 266- 7

(a) Draw a combined proportional divided semi-circle pie-chart to potray the information in the table

(b) What are the merits of using the statistical method in (a) above?
(c) Identify the with the
(i) Highest fish export value
(ii) Lowest fish import value
(d) Account for the development of the fishing industry in the country identified in (c)(i) above.

Suggested solution
Calculation

Suggested solution
Calculation
Area = πr^2
Area = Total export/Imports
Export
$\pi r^2 = 1,675,100$
$r = \sqrt{\frac{1,65,100}{3.14}} = 730$
Imports
$r = \sqrt{\frac{880,000}{3.14}} = 529$

Scale: let 1cm represent 100units
For export, $r = \frac{730}{100} = 7.3cm$
For imports, $r = \frac{529}{100} = 5.3cm$

Coverting to degrees

Export

Angola = $\frac{10,800}{1,675,100} x\ 180 = 1^0$

Ghana = $\frac{81,100}{1,675,100} x\ 180 = 9^0$

Peru = $\frac{852,200}{1,675,100} x\ 180 = 91.6^0$

Republic of South Africa = $\frac{259,000}{1,675,100} x\ 180 = 28^0$

Sweden = $\frac{472,000}{1,675,100} x\ 180 = 50.7^0$

Imports

Angola = $\frac{14,300}{880000} x\ 180 = 3^0$

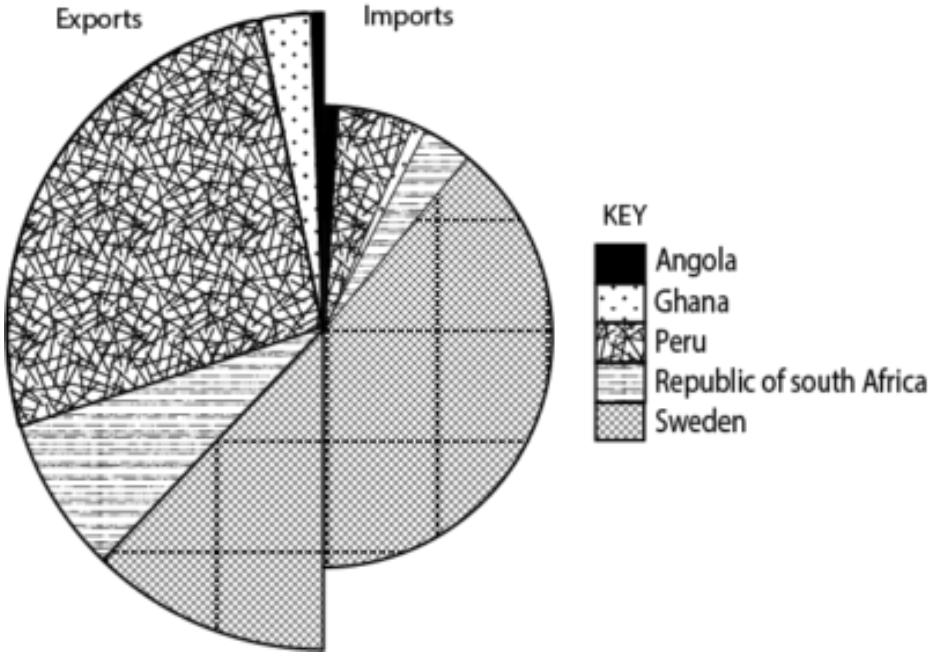
Ghana = $\frac{973,000}{880000} x\ 180 = 20^0$

Peru = $\frac{15,400}{880000} x\ 180 = 3^0$

Republic of South Africa = $\frac{64,100}{880000} x\ 180 = 13^0$

Sweden = $\frac{688,900}{880000} x\ 180 = 141^0$

A combined proportional divided semi-circle pie-chart annual average fish Export and Imports for selected countries (1998- 2000)



(b) Merits

- Gives a good visual impression
- Easy to read and understand
- Good for comparison purposes
- Can represent many variables/veratile
- Easyto draw/construct
- Easy to interpret

(c)(i) Sweden
(ii) Angola
(d)

- Availability/ abundance fish varieties
- Large forest reserves that provide timber for making boats
- Market for fish from european countries
- Presence of Baltic seaprovides sheltered water for fish breeding and multiplication
- High level of technology
- Improved research
- Skilled and unskilled labour for fish industry
- Favorable government policy
- Favorable political climate
- Efficient transport networks
- Availability of capital to invest in fish industry
- Fish provide nutritious food