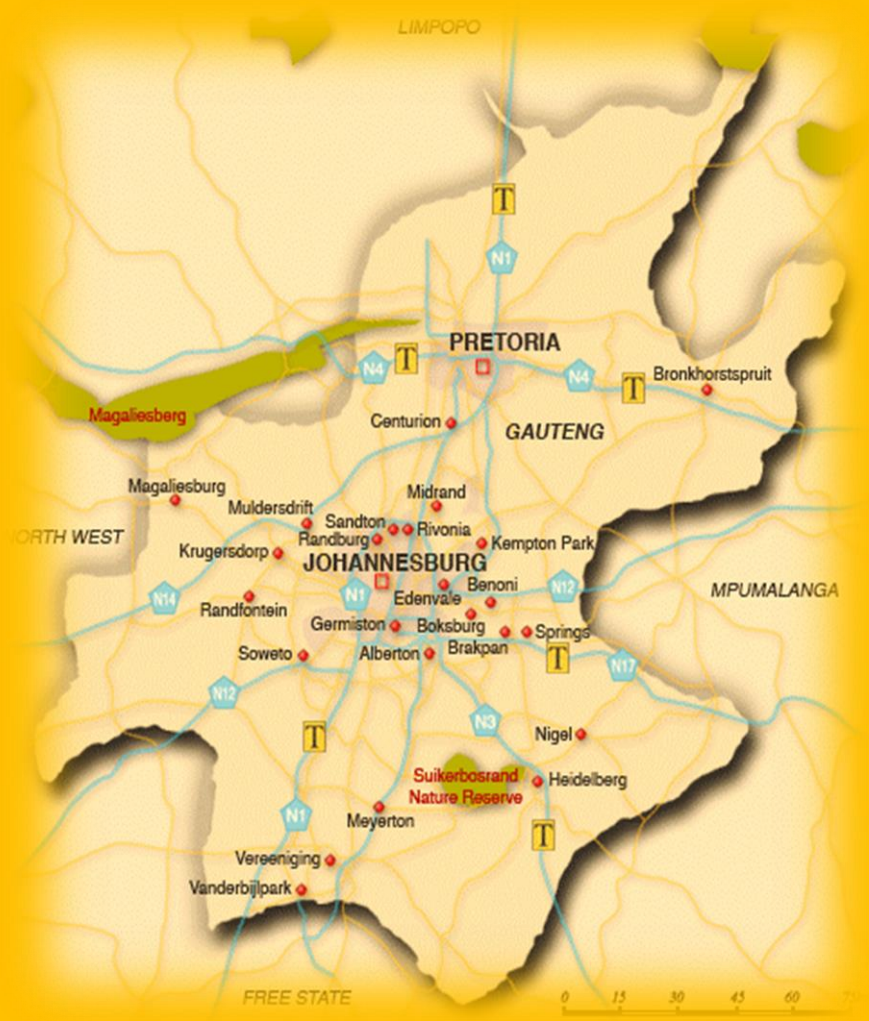
GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GEOGRAPHY GRADE 12 THEORY



2020








GEOGRAPHY GRADE 12
STUDY GUIDE
2020
(CAPS CURRICULUM)
Developed for the Gauteng Department of Education in partnership,
Matthew Goniwe School of Leadership and Governance
Gauteng Department of Education
Illustrations and Design
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Foreword

This Geography Study guide has been designed to meet the needs of learners to instil an improved involvement and interaction with the content and the study of Geography. The geographical knowledge is therefore presented in a meaningful way to navigate the Geography CAPS curriculum.

The learner is guided towards explaining and interpreting both physical and human geographical processes through the exploration of materials that will elicit an understanding of spatial processes, spatial distribution and human environment interactions *(The Aims of Geography)*

The layout and design provide a framework for conceptual learning of basic geographical concepts and enables an awakening of curiosity, stimulating thought and discussion on the topic. Difficult concepts are presented at the beginning with mind-maps, functional illustrations are presented to enhance understanding and improve retention of the geography subject content

CONTENT:

1. CLIMATE AND WEATHER

1.1 Mid-latitude cyclone
1.2 Tropical cyclone
1.3 Subtropical anticyclones and associated weather
1.4 Valley climate
1,5 Urban climate

2. GEOMORPHOLOGY

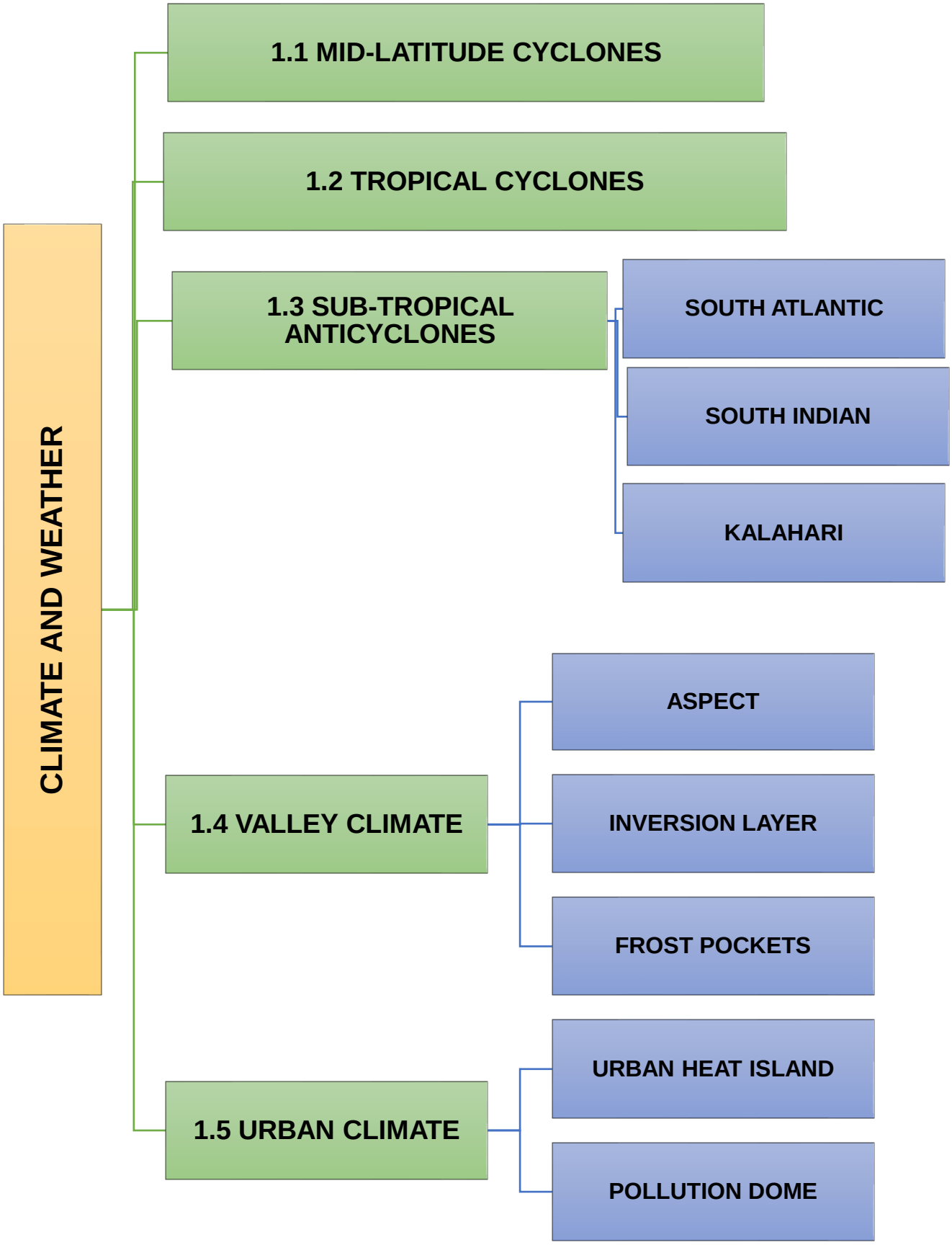
2.1 Drainage systems in South Africa
2.2 Fluvial processes
2.3 Catchment and river management

3. RURAL SETTLEMENT AND URBAN SETTLEMENT

3.1 The study of settlements
3.2 Rural settlements
3.3 Rural settlement issues
3.4 Urban settlements
3.5 Urban hierarchies
3.6 Urban structure and patterns
3.7 Urban settlement issues

4. ECONOMIC GEOGRAPHY OF SOUTH AFRICA

4.1 Structure of the economy
4.2 Agriculture
4.3 Mining
4.4 Secondary and tertiary sectors
4.5 Strategies for industrial development
4.6 The informal sector


CLIMATE AND WEATHER
1.1 MID-LATITUDE CYCLONES
1.2 TROPICAL CYCLONES
1.3 SUB-TROPICAL ANTICYCLONES
SOUTH ATLANTIC
SOUTH INDIAN
KALAHARI
1.4 VALLEY CLIMATE
ASPECT
INVERSION LAYER
FROST POCKETS
1.5 URBAN CLIMATE
URBAN HEAT ISLAND
POLLUTION DOME

KEY CONCEPTS AND TERMINOLOGY

Adiabatic: Temperature change due to change of height and pressure

Anabatic winds: Warm winds that blow up a valley slope during the day.

Anticyclone (high pressure): Forms as a result of sinking air. Air movement is anticlockwise, divergent (outwards), subsiding (sinking) in the southern hemisphere

Aspect: The direction in which a slope face.

Backing: A change in direction of wind in an anticlockwise direction

Berg winds: Hot, dry winds that blow from the interior of South Africa to coastal areas.

Climate change: Long-term changes to the global climate, resulting in unusual and extreme (stronger) weather conditions.

Cold front: The border zone between a cold air mass and a warm air mass

Cold sector: The area on the ground affected by cold air in a mid-latitude cyclone

Cyclone (low pressure): Forms as a result of rising air. Air movement is clockwise, convergent (inwards), rising (convection) in the southern hemisphere, e.g. Coastal low, tropical cyclone, mid-latitude cyclone.

Frost pocket: A low-lying area where frost regularly forms in winter

Heat island: Higher temperatures in urban areas than the surrounding rural area. There are many causes of heat island including pollution.

Hygroscopic nuclei: Particles in the air, such as salt, dust, and smoke, that attract water vapour and provide a surface for the water vapour to condense

Inter-tropical convergence zone (ITCZ): An area along the equator where the tropical easterlies from both hemispheres meet.

Inversion layer: Zone where sinking cold air meets with the rising warm air. A layer of the atmosphere in which temperature increases with height.

Katabatic winds: Cold winds that blow down a valley slope at night.

Polar Easterlies: Winds that blow from the pole towards subpolar low-pressure belts (90° to 60°).

Polar Front: Zone where cold polar air mass and warm tropical air mass meet

Radiation fog: Fog caused by air cooling to dew point as a result of terrestrial radiation

Temperature inversion: Temperature increasing with height.

Thermal belt: Zone of warmer temperature above the valley floor.

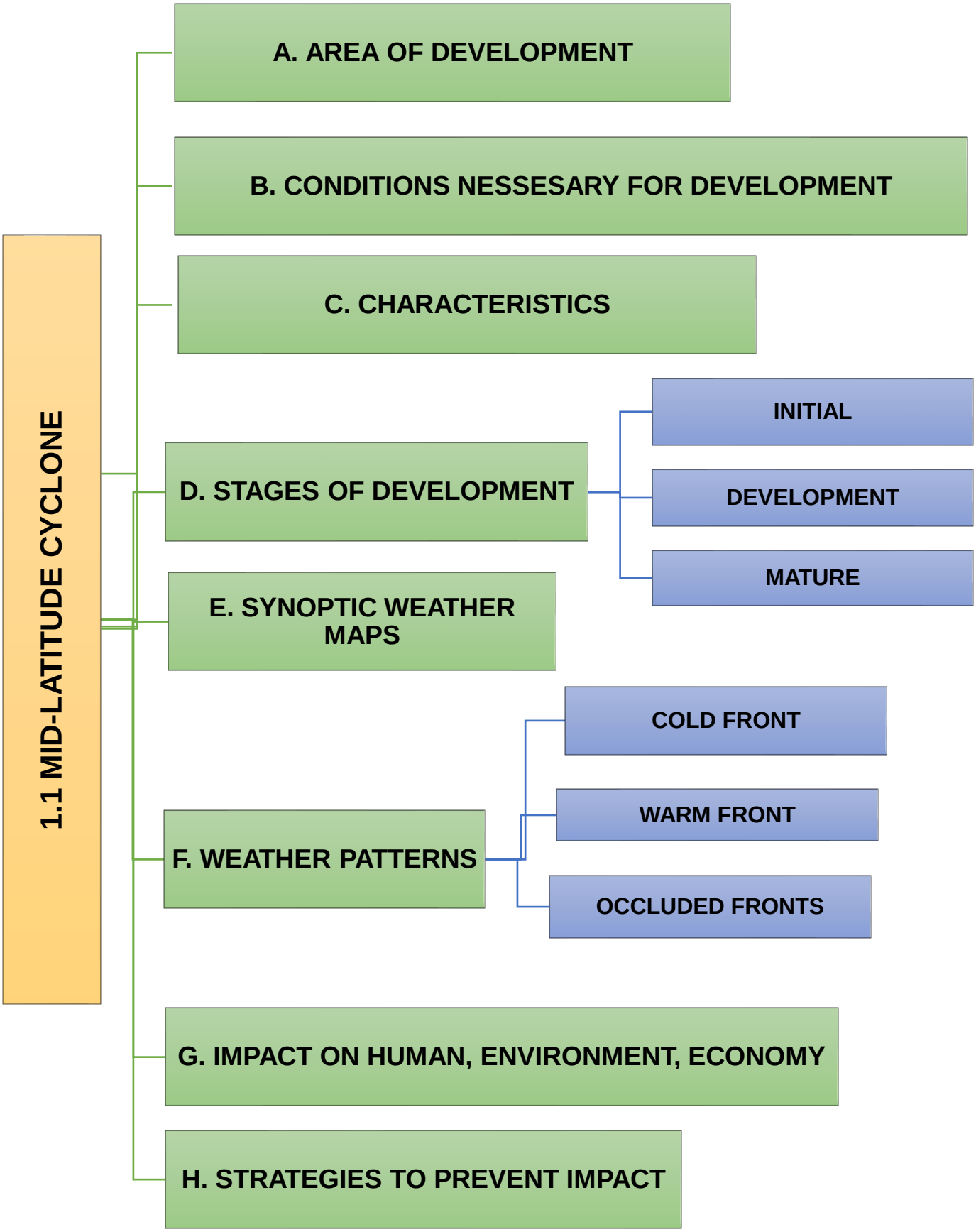
Tropical easterlies/trade winds: Winds that blow from the subtropical high belts towards the equatorial low-pressure belt (0° to 30°).

Veering: A change in the direction of winds in a clockwise direction

Warm front: The border zone between a warm air mass and a cold air mass

Warm sector: The area on the ground affected by warm air in mid-latitude cyclone

Westerlies: Winds that blow from the subtropical high-pressure belts to the subpolar low-pressure belts (30° to 60°).


1.1 MID-LATITUDE CYCLONE
A. AREA OF DEVELOPMENT
B. CONDITIONS NESSESARY FOR DEVELOPMENT
C. CHARACTERISTICS
D. STAGES OF DEVELOPMENT
INITIAL
DEVELOPMENT
MATURE
E. SYNOPTIC WEATHER MAPS
F. WEATHER PATTERNS
COLD FRONT
WARM FRONT
OCCLUDED FRONTS
G. IMPACT ON HUMAN, ENVIRONMENT, ECONOMY
H. STRATEGIES TO PREVENT IMPACT

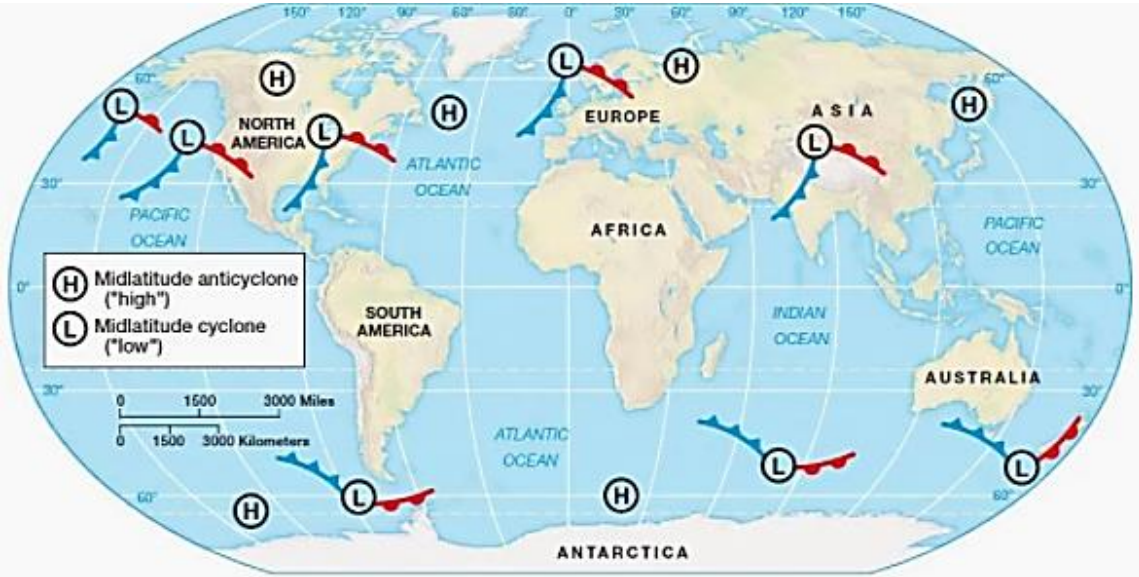
1.1 MID-LATITUDE CYCLONES

A. AREA OF DEVELOPMENT

- In Middle or temperate latitudes
- Between latitudes 30° - 60° north and south of the equator.
- Forms at a polar front where warm westerlies and cold polar easterlies meet

OTHER NAMES

- Moderate Cyclones,
- Extratropical Cyclones
- Temperate Cyclones



B. CONDITIONS NESSESARY FOR DEVELOPMENT

- Cold polar air mass from cold polar easterlies and warm tropical air from warm westerly winds, meet
- Cause an imbalance in energy distribution because of difference in temperature.
- Differences in wind patterns(direction) contribute to resultant formation.

More prominent in winter over South Africa because of the northward Migration of the ITCZ and with it the migration of the high-pressure cells

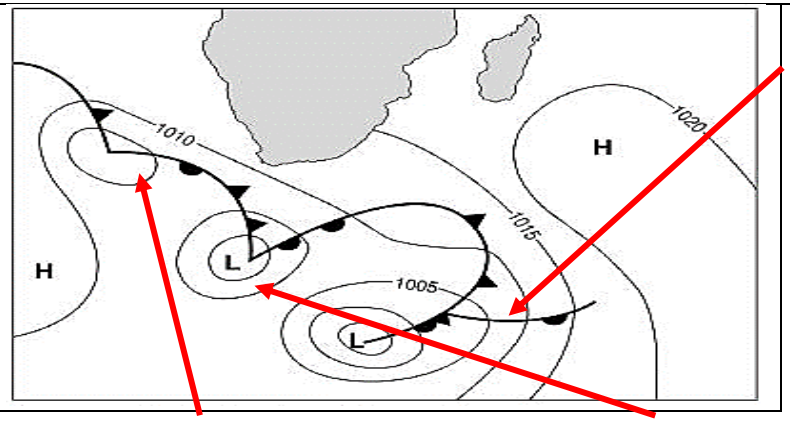
C. CHARACTERISTICS

- Extensive low-pressure in centre
- Clockwise movement of air in Mid-Latitude Cyclone in Southern Hemisphere
- Cold front
- Cold sector (air behind front cold)
- Warm front
- Warm sector (air behind front warm)
- Isobar pattern is oval
- Moves from west to east because of stronger westerly winds
- The Western side of continents in the middle latitudes
- Diameters are between 1 500 and 3 000km
- Speed of about 50 – 60 km per hour
- Lifespan of between 4 and 14 days.
- They usually occur in families.; Forms all year but better developed in Winter from April to October in South Africa

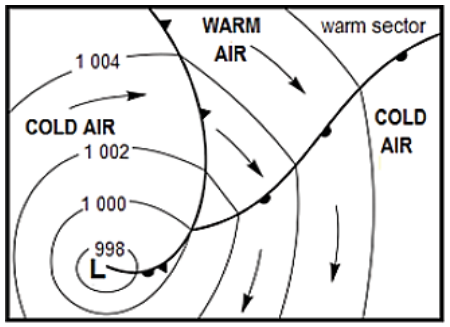
D. DEVELOPMENT STAGES OF A MID-LATITUDE CYCLONE

Cyclogenesis:

The development and strengthening of a cyclone

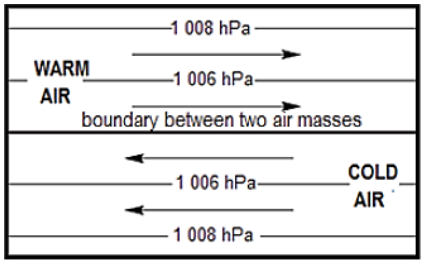


4. OCCLUDED STAGE



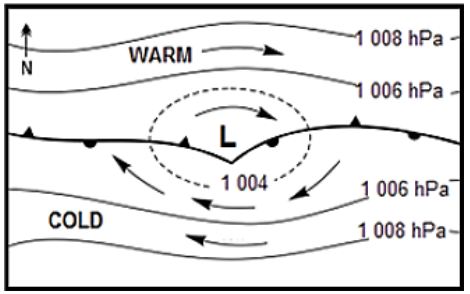
- Warm sector continues to narrow.
- Cold front overtakes the warm front Cold air wedges in under warm air
- The warm air then becomes isolated from the ground.
- This is called an occlusion

1. INITIAL STAGE



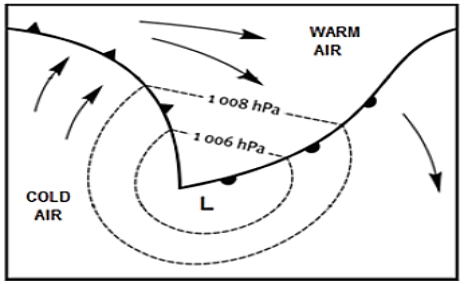
- The Polar front is stationary
- Warm westerly and cold polar easterlies blow in opposite directions along the polar front.
- The different air masses do not have the same density, temperature and humidity.
- Therefore, they do not mix
- Friction develops between the air masses.
- The polar front forms a wave due to the friction

2. DEVELOPMENT STAGE



- A wave develops in the polar front.
- A small mass of warm air extends into the cold air and rises over.
- This rising air cause a low pressure in the centre.
- The low pressure intensifies.

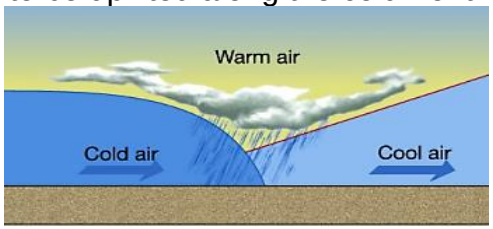
3. MATURE STAGE



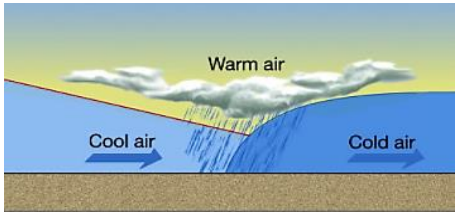
- The low pressure intensifies
- It moves into the westerly wind belt away from the polar front.
- A well-developed cold and warm sector develops.
- The cold dense air moves faster and forces the light humid less dense air to rise in the warm sector.
- The cold sector becomes larger than the warm sector as the cold air moves and lifts the warm air.

Two types of occlusions:

1. **A cold front occlusion: W**hen the coldest air is behind the cold front. This causes the warm front to be uplifted along the cold front

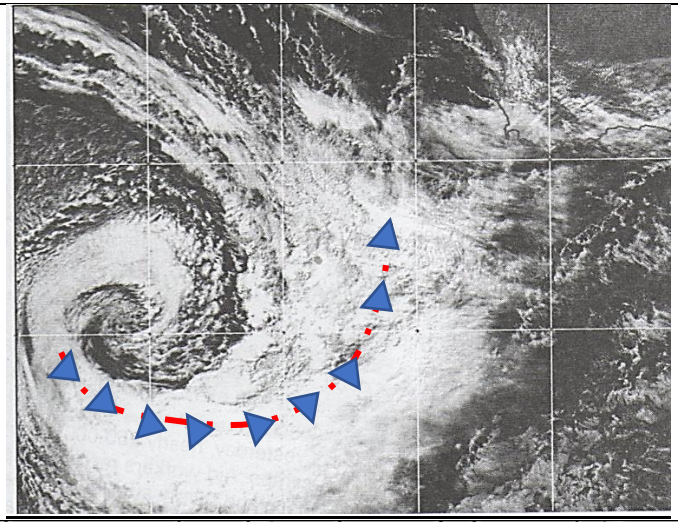


2. **A warm front occlusion:** This is found when the coldest air is found ahead of the warm front

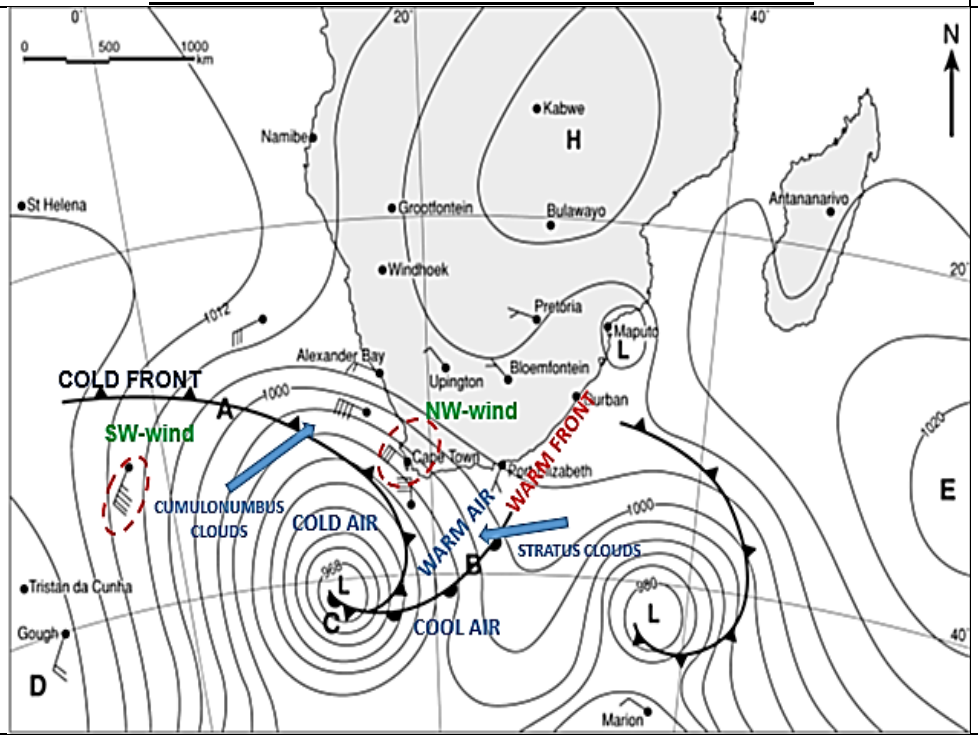


E. SATELLITE IMAGES AND SYNOPTIC WEATHER MAPS

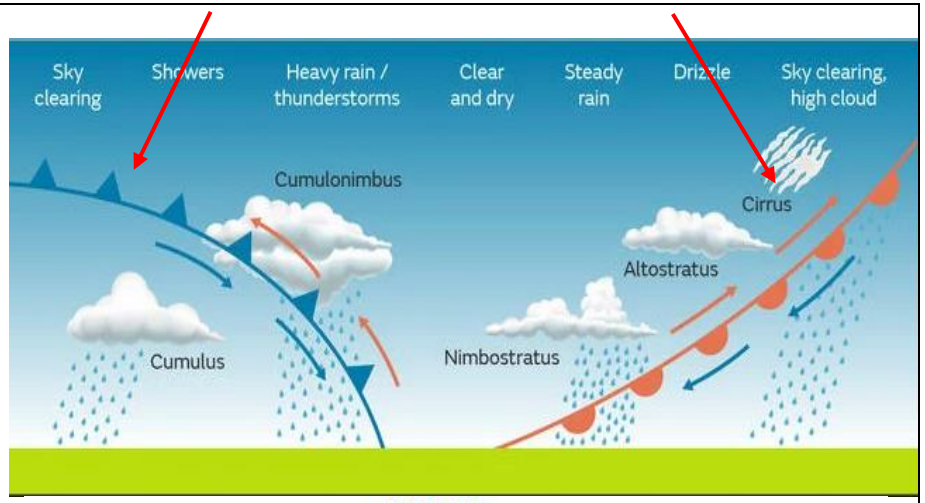
S		C	COLD FRONT	WARM FRONT

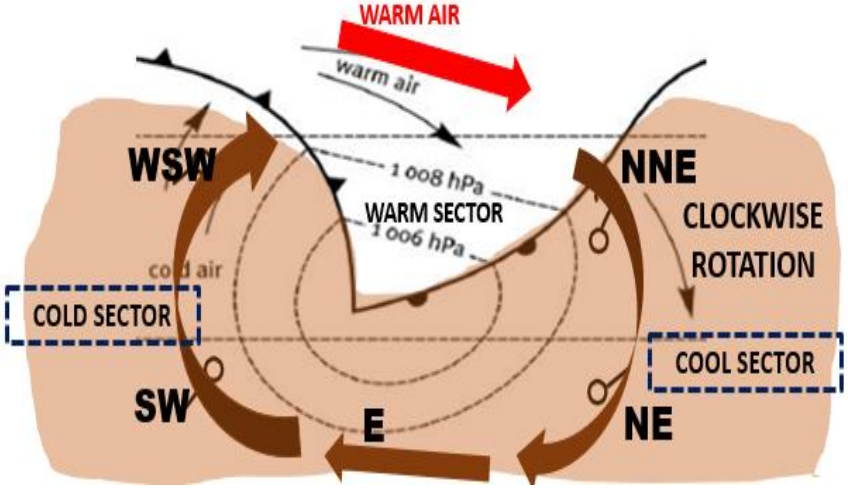


SYNOPTIC WEATHER MAP



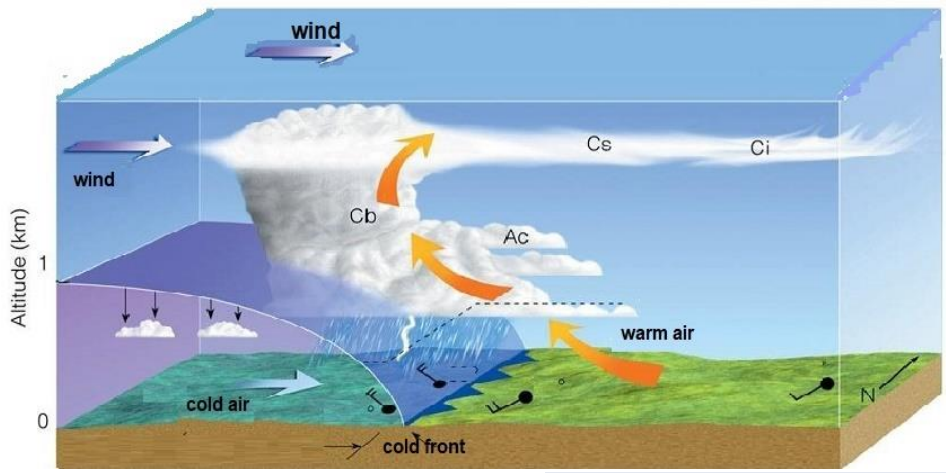
TOP VIEW / PLAN VIEW



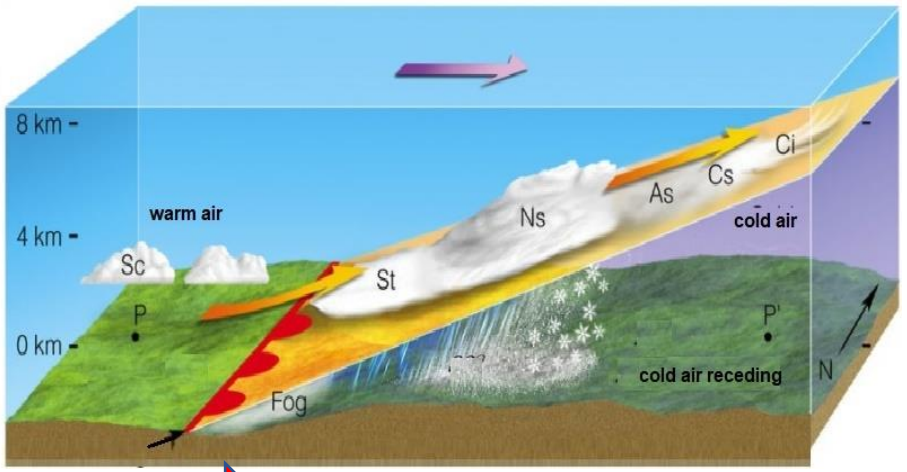


F. ASSOCIATED WEATHER PATTERNS

COLD FRONT



WARM FRONT



WEATHER	COLD SECTOR	COLD FRONT	WARM SECTOR	WARM FRONT	CYCLONE APPROACHING
Air pressure	Increase continues at slow rate	Sudden increase	Remains steady	Decrease stops	Steady decrease
Wind direction	South	Backing from west to south	West	Backing from north-west to west	Northwest
Wind speed	Gusty, decrease slowly	Very strong to gale force	Decrease	Strong	Increase slowly
Temperature	Cold, around 5 °C	Sudden decrease	Warm to mild, around 12 °C	Sudden rise	Cool, around 8 °C
Relative humidity	Rapid fall	High during precipitation	Steady and high	High during precipitation	Slow rise
Cloud cover	Decreasing in succession to cumulus	Very thick and towering cumulonimbus	Low stratus clouds with clear patches in between	Low and thick nimbostratus	High and thinner clouds altostratus, cirrostratus and cirrus
Precipitation	Heavy and later soft, persistent showers	Short period of heavy rain and hail	Intermittent drizzle or stop	Continuous rainfall – steady and quite heavy	None
Visibility	Very good, but poor in showers	Poor, especially in showers and fog	Often poor	Decrease rapidly	Good, but decreasing with nearing front

REASONS FOR WEATHER CHANGES IN COLD FRONT

CHANGE	COLD FRONT	REASON
Temperature	Decrease	Cold air behind front has arrived
Wind	"backs" becomes SW	Clockwise rotation from air around the low pressure
Cloud cover	Increases	Warm air rises over the approaching cold air, cools and condenses
Cloud type	Cumulonimbus	Cold air forces the warm air to rise sharply therefore condensation occurs to great heights
Pressure	Drops then rises	Pressure at its lowest just before cold front then it rises as cold air arrives
Rainfall	Heavy rainfall over small area	Strong convection and cumulonimbus clouds

G. IMPACT ON HUMANS, ECONOMY AND ENVIRONMENT

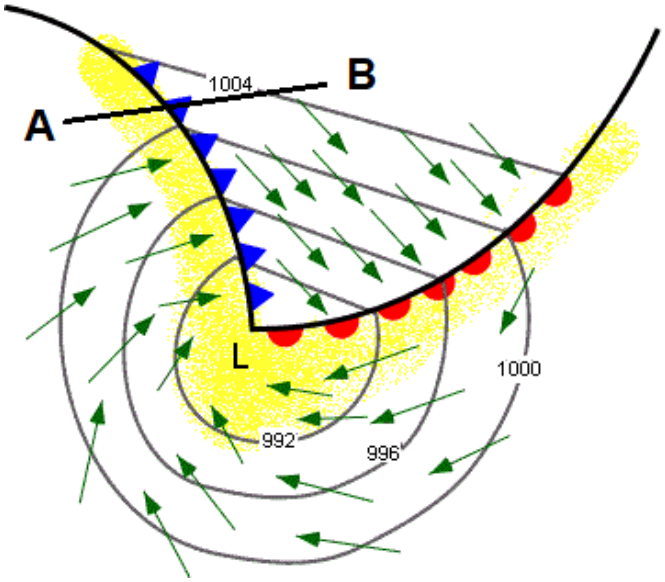
	HUMANS	ENVIRONMENT	ECONOMY
POSITIVE	• Winter rainfall determined type of crops that are cultivated • Rain replenish water in dams • Snow in mountains replenish water when melts	• Winter rainfall is necessary for winter crops • Production of winter crops results in food security	• Production of winter crops benefits the GDP •
NEGATIVE	• Snow that falls is dangerous for people • Extreme cold can result in power cuts and disruption of human activities • Bergwinds that develop in warm sector is hot and dry and can cause veld fires • Gale force winds behind cold front results in stormy conditions over ocean and is a danger to ships • Heavy rain from cold front leads to poor visibility and traffic accidents • Mountain passes may be closed if there is snow	• Snow that falls is dangerous for livestock • Extreme cold damage crops and livestock • Bergwinds damage vegetation because of dry warm conditions • Gale force winds damage crops • Heavy rain cause floods and crops and livestock are damaged	• Expensive for farmers to protect crops and livestock • Floods can damage crops and impact the economy negative

H. STRATEGIES TO MINIMISE THE IMPACT OF MID-LATITUDE CYCLONES

• Monitoring the development of Mid-Latitude cyclones • Early warning and communication for people to prepare • Evacuate low lying areas to protect against floods	• Keep livestock in barns to protect them against the cold plant winter crops that can resist cold • People should stay indoors to protect them against the cold, wind and rain

ACTIVITY 1.1 MID-LATITUDE CYCLONES

1.1 Refer to FIGURE 1.1 to answer the following questions.



1.1.1 Identify the weather phenomenon illustrated in FIGURE 1.1. (1 x 1) (1)

_____

1.1.2 Give TWO reasons why one can say that this weather system is found in the Southern Hemisphere. (2 x 1) (2)

_____

_____

1.1.3 Identify the developmental stage of the phenomenon and give one evidence from FIGURE 1.1 as evidence. (2 x 1) (2)

_____

_____

1.1.4 Draw a cross section from point A to B. Clearly indicate the main cloud type and air movement. (3 x 1) (3)

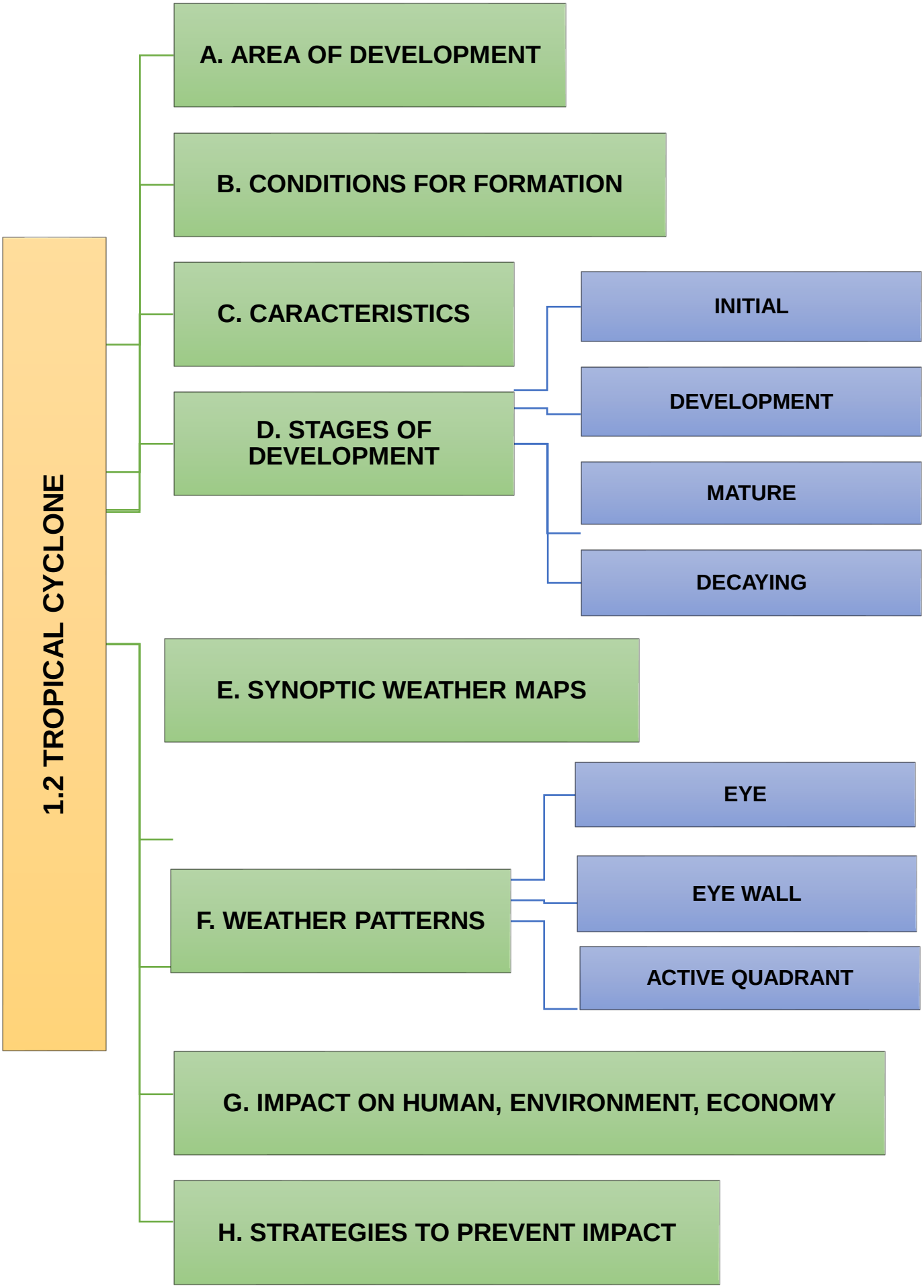
_____

1.1.5 In a paragraph of approximately EIGHT lines, evaluate the positive and negative impact that this weather phenomenon will have on tourism in the Western Cape. (4 x 2) (8)

_____

_____

_____


1.2 TROPICAL CYCLONE
A. AREA OF DEVELOPMENT
B. CONDITIONS FOR FORMATION
C. CARACTERISTICS
D. STAGES OF DEVELOPMENT
INITIAL
DEVELOPMENT
MATURE
DECAYING
E. SYNOPTIC WEATHER MAPS
F. WEATHER PATTERNS
EYE
EYE WALL
ACTIVE QUADRANT
G. IMPACT ON HUMAN, ENVIRONMENT, ECONOMY
H. STRATEGIES TO PREVENT IMPACT

1.2. TROPICAL CYCLONE

A. AREA OF DEVELOPMENT

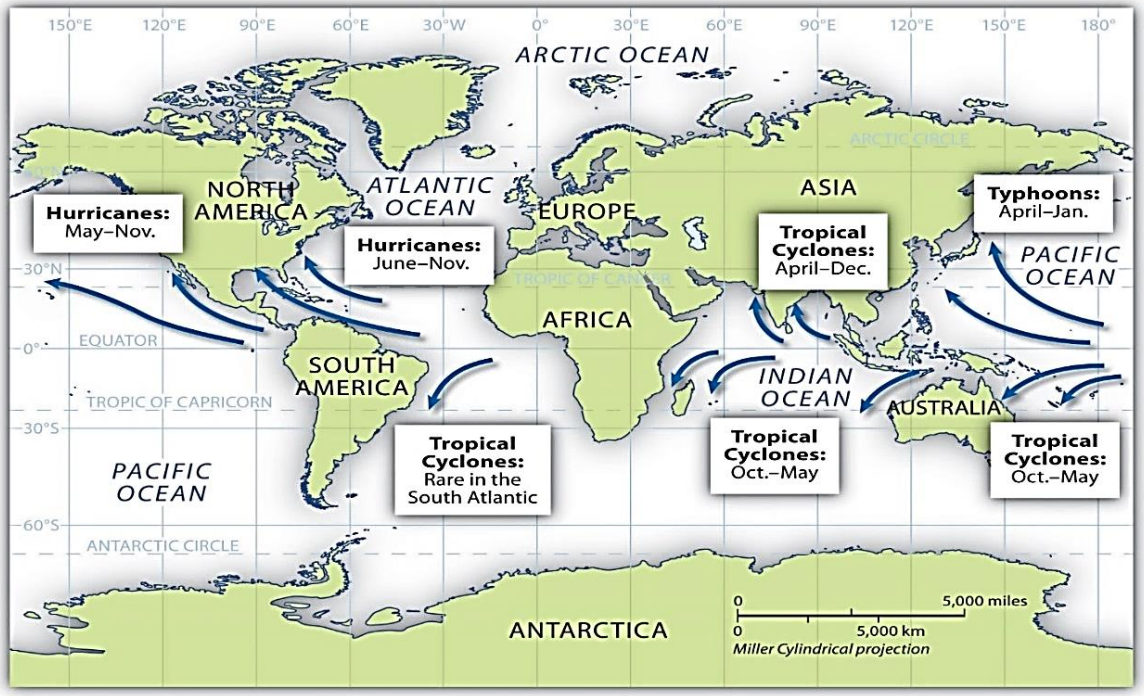
- Between latitudes 30° N and 30°S
- Tropical easterlies
- Not between equator and 5°N and 5°S because there is 0 Coriolis force

OTHER NAMES

- Hurricane: Golf of Mexico
- Typhoon: Japan and eastern China
- Tropical cyclones: Africa and Australia

SOURCE OF ENERGY

- Latent heat released as warm, moist tropical air condenses



B. CONDITIONS NESSESARY FOR DEVELOPMENT

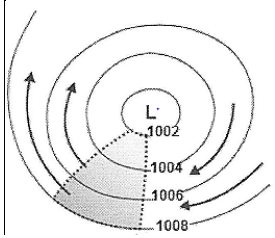
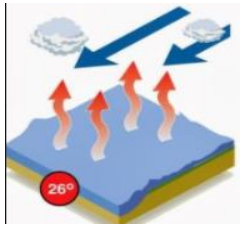
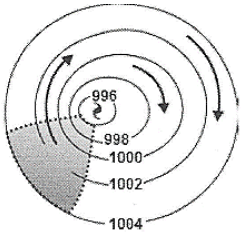
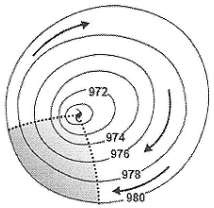
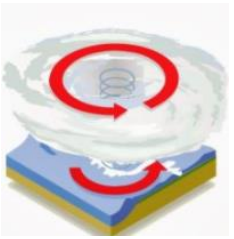
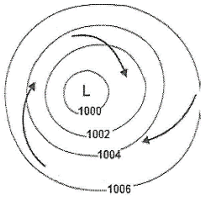
REASONS FOR DEVELOPMENT

• 5° N and S of equator • Develop only over the ocean • Ocean must be warmer than 26.5 °C • Hot moist air because of evaporation • Unstable air results in condensation • Surface air convergence • Upper air divergence • Intense low-pressure cell enhanced by the tropical jet stream in upper air	• Deflection only starts at 5°N and S of equator. Needs Coriolis force to cause spiralling winds • Deflection of air results in clockwise circulation in Southern Hemisphere • Less friction over a smooth surface • High evaporation rate to feed the LP system • Creates unstable air • Condensation release latent heat • More moist air is drawn into the system • Air is forced to rise when upper air convergence taking place • Stronger surface convergence, convection and upper air divergence

C. CHARACTERISTICS

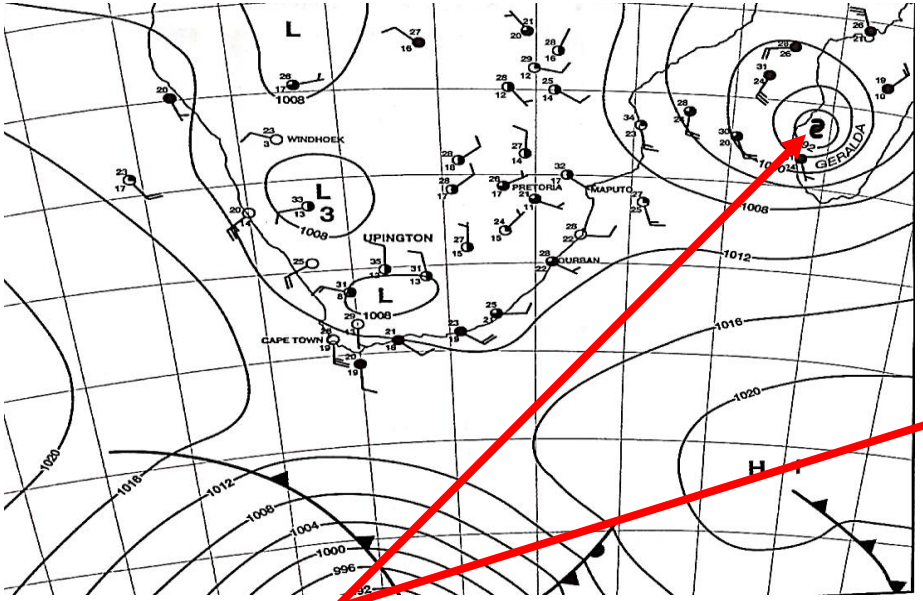
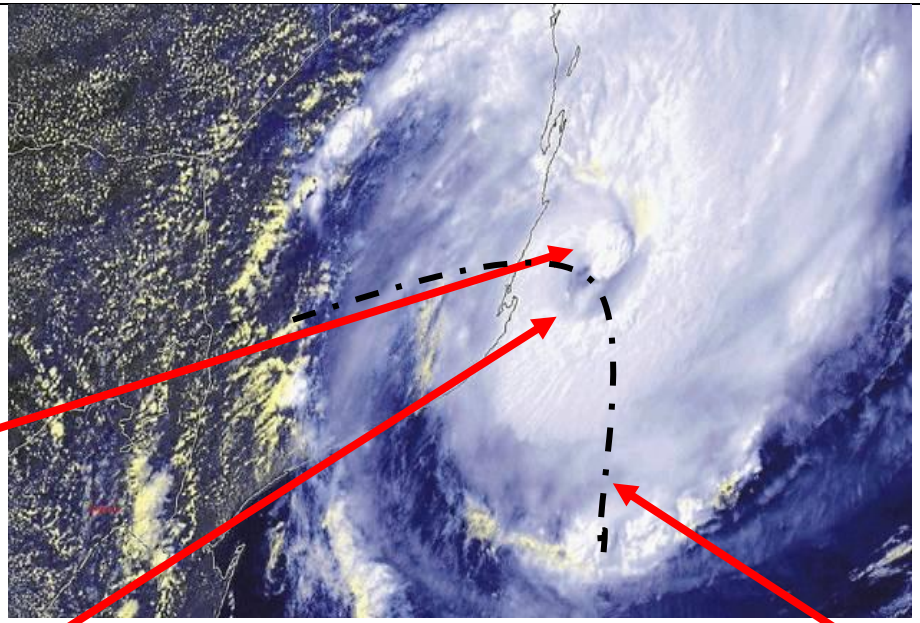
• Intense low-pressure system, below 1000 hPa • Late summers and autumn over warm tropical oceans • Clockwise movement of air in Mid-Latitude Cyclone in Southern Hemisphere • Steep pressure gradient • Move from west to east within the tropical easterlies • Eye in centre of low pressure	• Winds up to 300km/h • High Cumulonimbus clouds in wall of eye • Heavy rain, hail, storm surges and hurricane winds • Receive alphabetic names • Affect east coast of continents • Moves only over oceans, dies out over land because of friction and lack of moisture • Named alphabetically

D. DEVELOPMENT STAGES OF A TROPICAL CYCLONE

INITIAL STAGE	DEVELOPMENT STAGE	MATURE STAGE	DECAYING STAGE
 	 	 	

• Convergence of air towards a low pressure • Creates a vortex • Air pressure about 1002hPa • Wind speed up to 60 km/h	• Intensity of storm increases as air continue to coverge and rise in LP centre • Divergence takes place in upper atmosphere • Air pressure drops below 990hPa • Wind speed increases to about 120 km/h • Eye forms in centre of LP • Huge cumulonumbus clouds forms around the eye and swirls to form a vortex	• Storm reach its maximum intensity • Pressure drops to about 950 hPa • Wind speed exceed 180 km/h • Fully developed eye • Eye is clear, cloudless due to cooler subsiding air • Vortex well developed • Wind speed and up to 600 km in diameter • Torrential rain, thunder and lighting experienced	• Air cools down when entering the temperate latitudes • Cooler air flows into the cyclone increasing the pressure • When moving inland, supply of moisture is cut of and surface friction slows it down

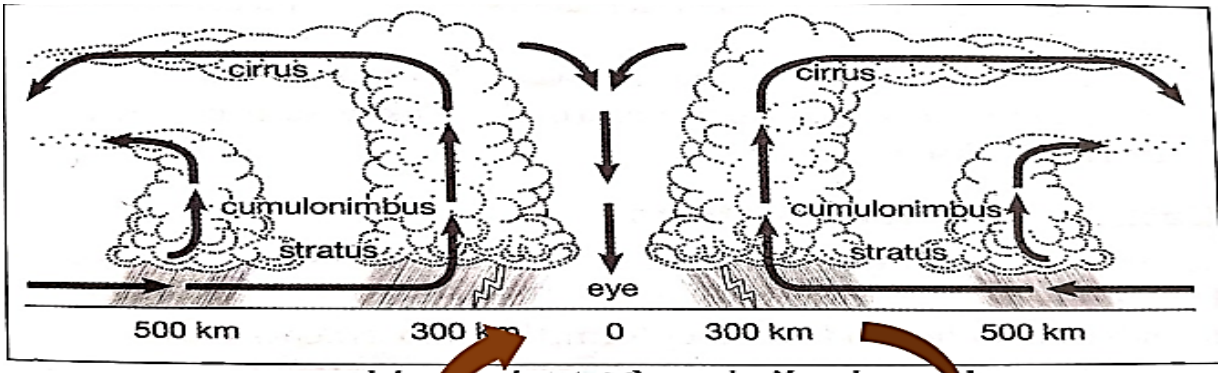
E. SATELLITE IMAGES AND SYNOPTIC WEATHER MAPS

SYNOPTIC WEATHER MAP	SATELLITE IMAGE
	

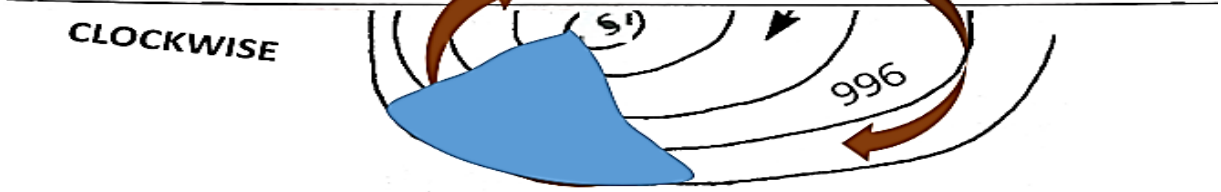
EYE	THE EYE WALL	ACTIVE QUADRANT
Decending air in centre of storm which results in: • Period of calm /stable conditions • No clouds • No wind • Air pressure below 1000hPa • Increase of temperatures because of adiabatic heating • No presipitation •	• The eyewall consists of a ring of tall cumulonimbus clouds • Thunderstorms that produce heavy rains and usually the strongest winds. • Changes in the structure of the eye and eyewall can cause changes in the wind speed, which is an indicator of the storm's intensity. • The eye wall is the strongest part of the storm • The air located in the eye wall moves faster than any other part of the storm and it pulls in warmer ocean water to fuel the storm.	• Strongest region of Tropical Cyclone • When winds rotating around the storm centre coincide with the winds moving the cyclone system • Forward left-hand quadrant in southern hemisphere due to the forward motion contributing to the rotation of the storm. • This side of the storm tends to have higher winds, higher storm surge, seas, and the highest rainfall. • This is not to be confused with the strongest part of a tropical cyclone which is the eye wall.

F. ASSOCIATED WEATHER PATTERNS

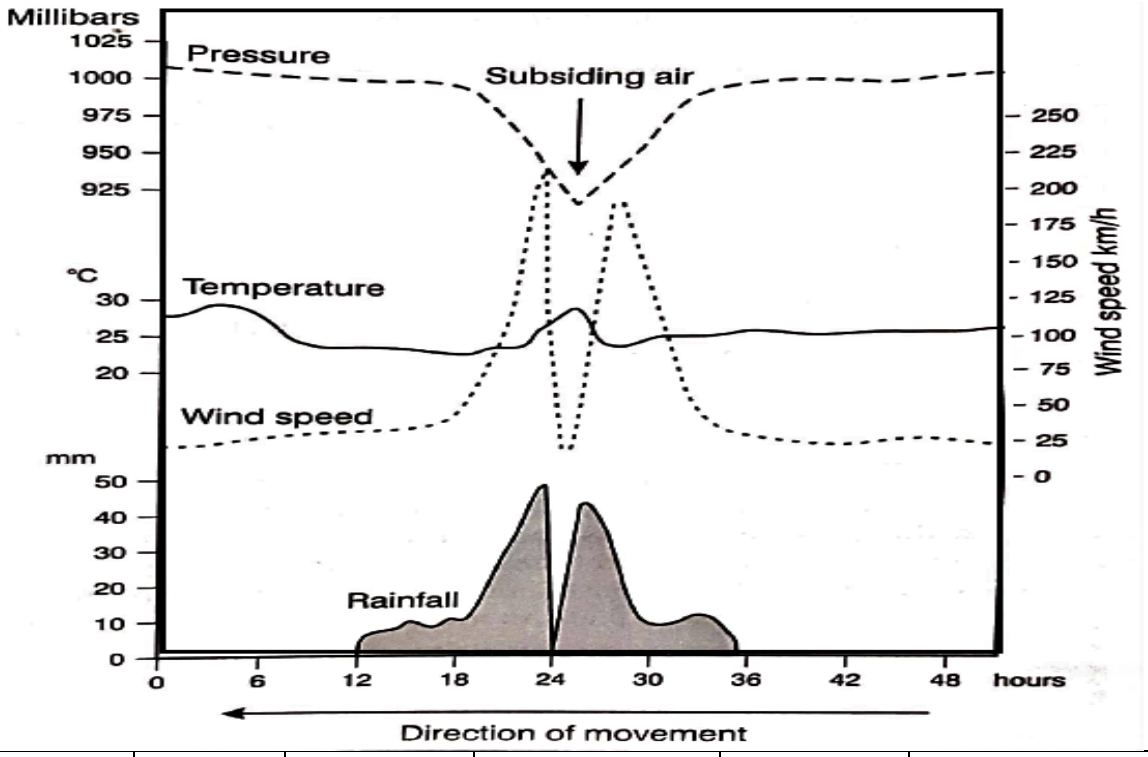
CROSS-SECTION



TOP VIEW



WEATHER ELEMENTS



	1	2	3	4	5
Air pressure	Dropping	Drops	< 950hPa	Rises but still low	normalises
Temperature	±26°C	Drops due to cloud cover	Rises to ± 28°C due to adiabatic heating	± 26°C	normilises
Wind speed	Fast	Hurricane strength winds – Strongest in the cyclone	Calm in the eye, no wind	Hurricane strength wind,	Slow down and normilises
Rainfall	Light rain	Torrential rain	Clear up, no rain	Torrential rain	Softer rain that clears up

G. IMPACT ON HUMANS, ECONOMY AND ENVIRONMENT

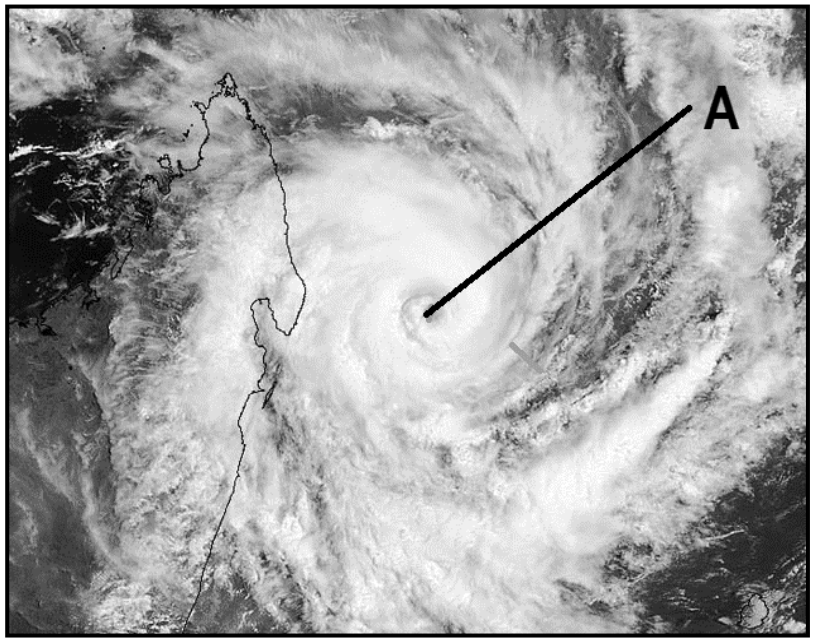
HUMANS	ENVIRONMENT	ECONOMY
• Cause torrential rain and risk of flooding • Strong winds damage power lines, shatter windows and rip off roofs • Storm surges cause damage to the coastal areas • Damage infrastructure: roads and bridges washed away • Loss of homes • Starvation • Damage water and sewerage pipes • Wind and water damage power lines • Deaths and injuries because of wind, floods and storm surges • Outbreak of deceases e.g. cholera • Major financial strain on families • Subsistence farmers lose everything	• Strong winds cause storm surges which can cause rapid rise in sea-levels • Swell of waves is dangerous for fisherman • Floods and salt water destroy agricultural crops • Flooding and rise in river levels because of rain can cause mudslides and landslides • Destroy ecosystems and biodiversity • Livestock drown • Lack of clean water • Threatening of food security	• Airports are closed • Damage harbour facilities Businesses are closed • No trading is possible • Costly to repair damages • Job losses, unemployment • High medical expenses • Put a strain on local civic services

H. STRATEGIES TO MINIMISE THE IMPACT OF TROPICAL CYCLONES

• Monitoring the development of Tropical cyclones • Satellite tracking can monitor the development and path • Advanced weather predictions and warnings • Satellite born censors to collect details e.g. rainfall rates • Early warning and communication for people to prepare • Evacuate low lying areas to protect against floods • Ensure that infrastructure is of good quality	• Keep livestock in barns to protect them against the wind and rain • People should stay indoors to protect them against flying debris, wind and rain • Upgrade technology in LEDC countries • Good medical care will reduce outbreak of deceases • Good emergency services that is well-equipped • Local civic services should be well-prepared to assist

ACTIVITY 1.2 TROPICAL CYCLONES

1.2 Refer to FIGURE 1.2, a satellite image showing a tropical cyclone, to answer the questions below.



1.2.1 In which hemisphere is the weather system, illustrated by FIGURE 1.2, occurring?

_____

(1 x 1) (1)

1.2.2 Give TWO reasons for your answer to QUESTION 1.2.1.

_____

_____

(2 x 1) (2)

1.2.3 State ONE condition required for the formation of the weather system illustrated by FIGURE 1.3.

_____

(1 x 1) (1)

1.2.4 Identify Label **A** on the satellite image.

_____ (1 x 1) (1)

1.2.5 Explain why **A** experiences clear skies.

_____

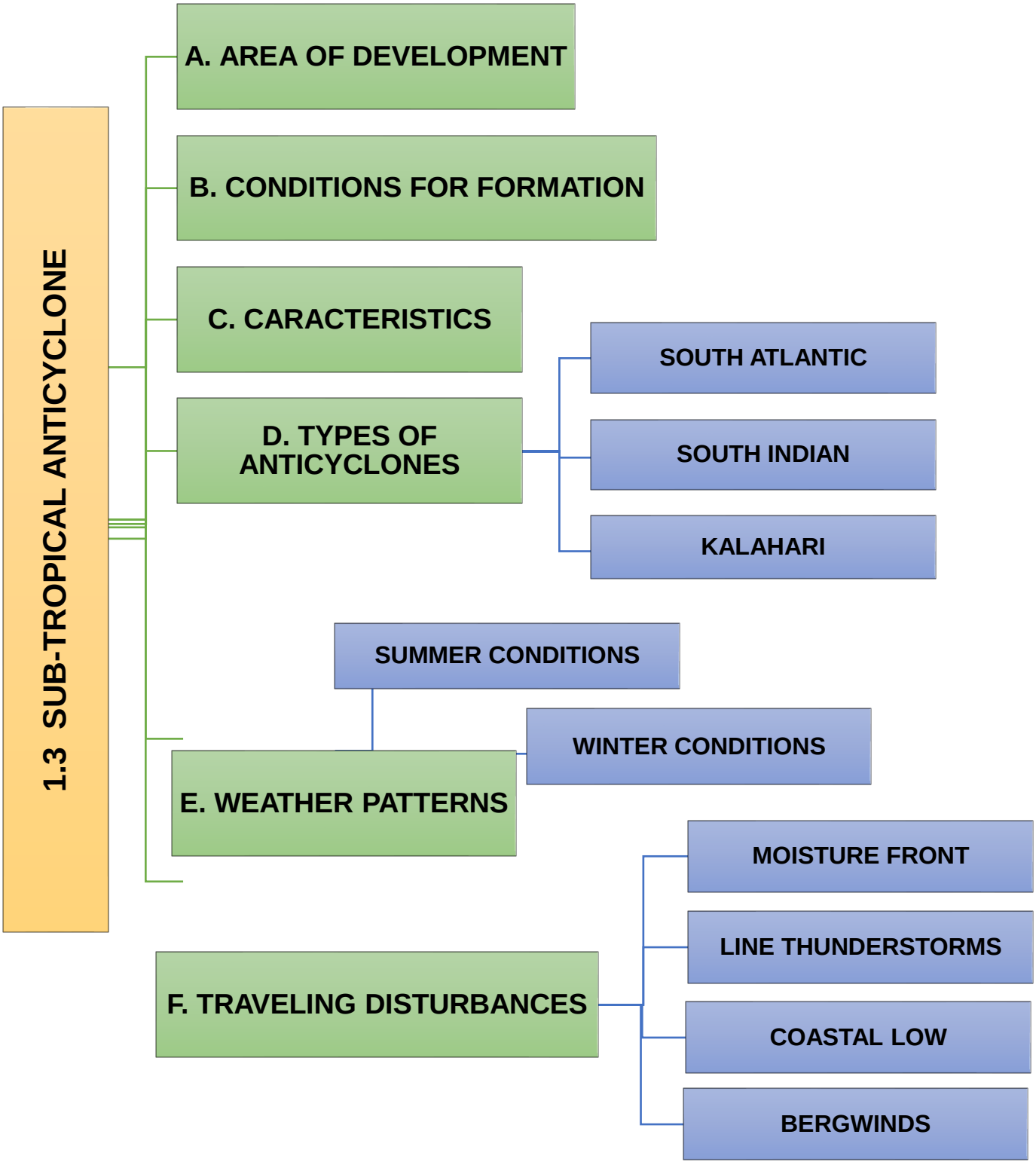
(1 x 2) (2)

1.2.6 Write a paragraph of approximately EIGHT lines in which you explain why the weather system, illustrated by FIGURE 1.3, causes a greater negative social impact in developing countries than in developed countries.

_____

_____

_____ (4 x 2) (8)


1.3 SUB-TROPICAL ANTICYCLONE
A. AREA OF DEVELOPMENT
B. CONDITIONS FOR FORMATION
C. CARACTERISTICS
D. TYPES OF ANTICYCLONES
SOUTH ATLANTIC
SOUTH INDIAN
KALAHARI
E. WEATHER PATTERNS
SUMMER CONDITIONS
WINTER CONDITIONS
F. TRAVELING DISTURBANCES
MOISTURE FRONT
LINE THUNDERSTORMS
COASTAL LOW
BERGWINDS

1.3 ANTICYCLONES

A. AREA OF DEVELOPMENT

- Subtropical high-pressure zone
- 30° South of equator
- Dominant pressure belt over South Africa

THREE ANTI-CYCLONES

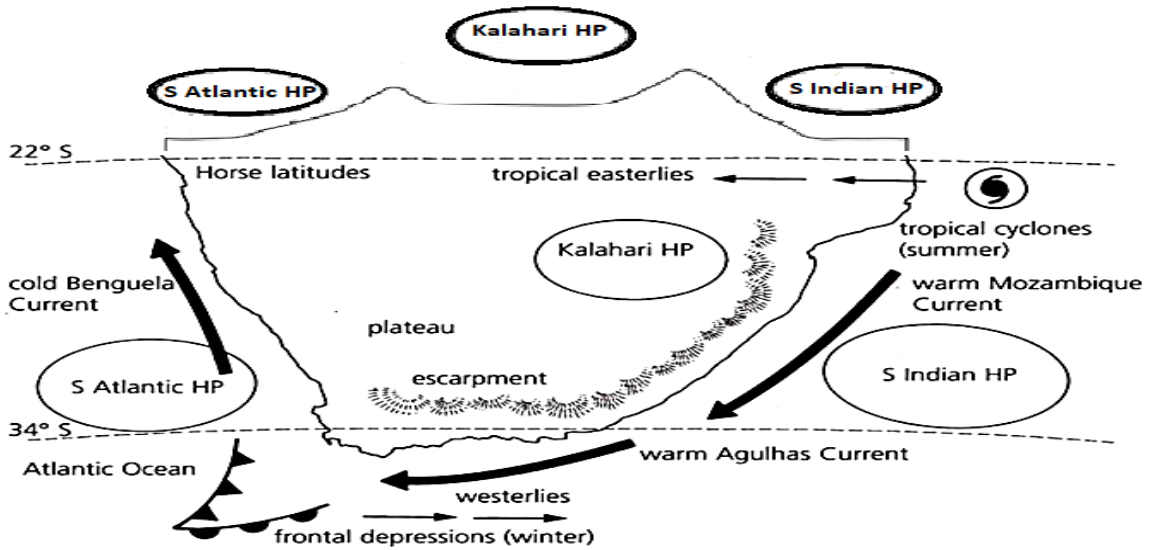
- South Atlantic anticyclone
- South Indian Anticyclone
- Kalahari Anticyclone

B. CONDITIONS NESSESARY FOR DEVELOPMENT

- Descending air from tropical and mid-latitude cells
- 30° North and South of equator

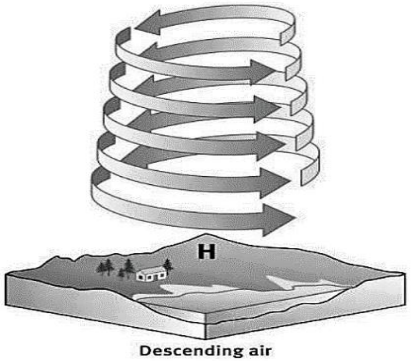
CROSS SECTION

TOP VIEW



C. CHARACTERISTICS

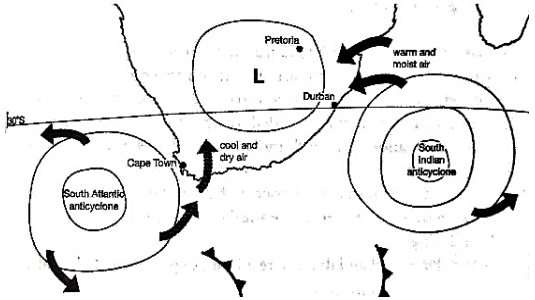
- Anticlockwise circulation
- Dry descending air results in stable atmospheric conditions and intensifies high pressure system.
- Adiabatic warming of decending air in the anticyclone
- Clear skies and sunshine
- Responcible for the semi-arid conditions over South Africa
- Winds blow outwards in an anti-clockwise direction in the southern hemisphere.
- More prominent in winter over South Africa because of the northward Migration of the ITCZ.
- Effect climate of South Africa
- Relief affects how anticyclones affects rainfall patterns



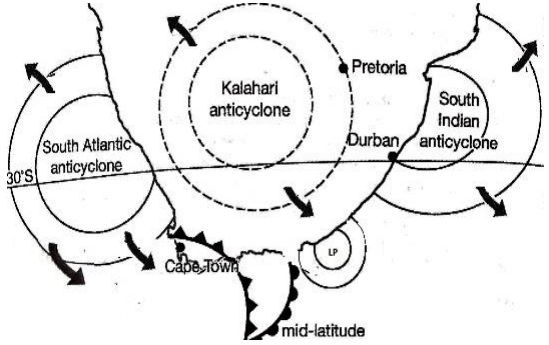
D. THREE ANTICYCLONES THAT HAVE AN IMPACT ON SOUTH AFRICA'S CLIMATE

SOUTH ATLANTIC ANTICYCLONE

- Semi-permanent and semi-stationary
- Situation – Namibian coast
- Changes are seasonal, linked to seasonal shift of ITCS
- Clear, stable weather
- Air moves Anticlockwise around system
- Cool dry air moves onto the western and southern coasts
- May deflect mid-latitude cyclones away from the coast in summer or



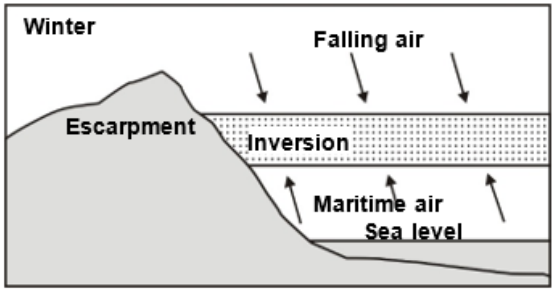
- When SAHP ridges behind cold front weather along front will intensifies



KALAHARI ANTICYCLONE

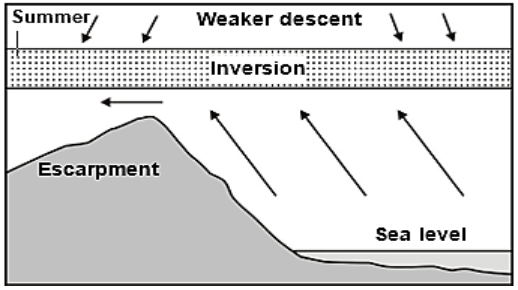
Winter:

- Temperature is lower
- Cool dense air sinks onto the interior
- Sinking air compress and heat adiabatically which cause lower layers to be warmer than those above
- Inversion is formed below the escarpment
- Pressure system rests on escarpment and prevents warm air from the Indian Ocean to reach the interior



Summer:

- Warmer air above plateau
- Inversion is formed below the escarpment
- Moist air from the Indian Ocean can flow into the interior which results in summer rainfall



SOUTH INDIAN ANTICYCLONE

- Semi-permanent and semi-stationary
- Air moves Anticlockwise around system
- When close to SA – moist winds reach the coast
- Situation - east coast of South Africa
- Blow over warm ocean
- Warm, moist air
- Cooler land could cause precipitation
-

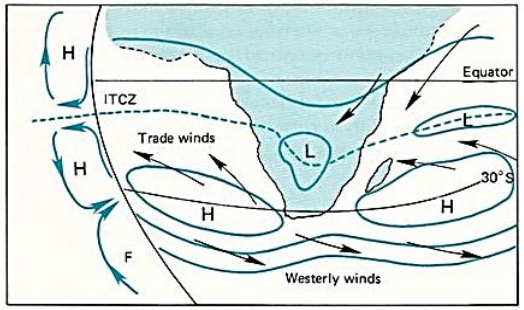
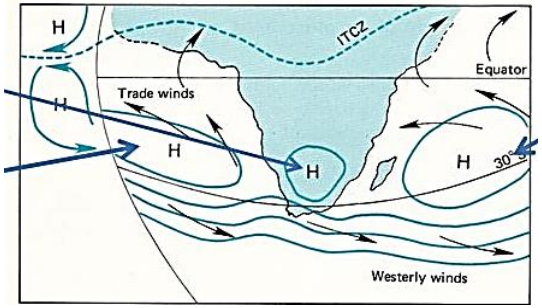
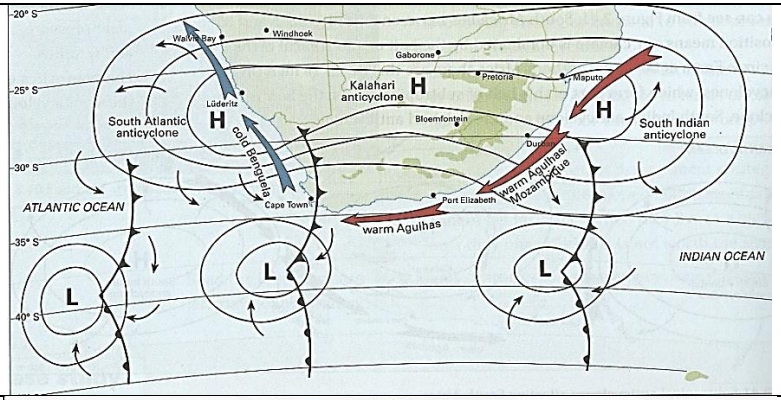
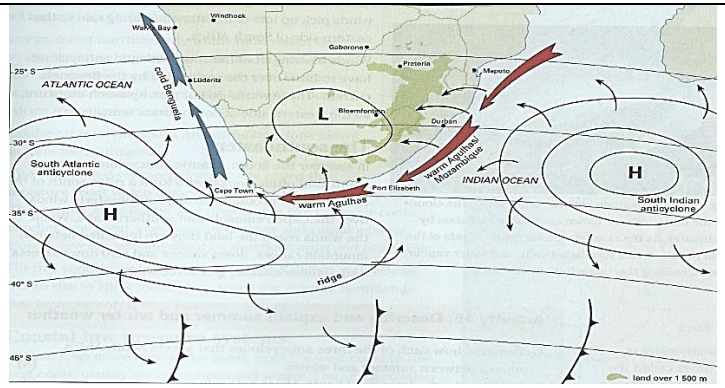
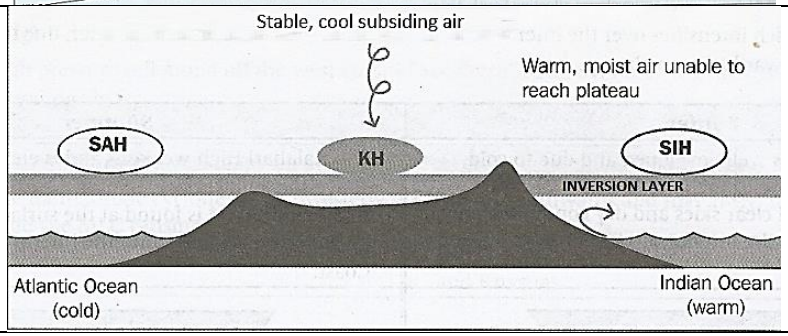
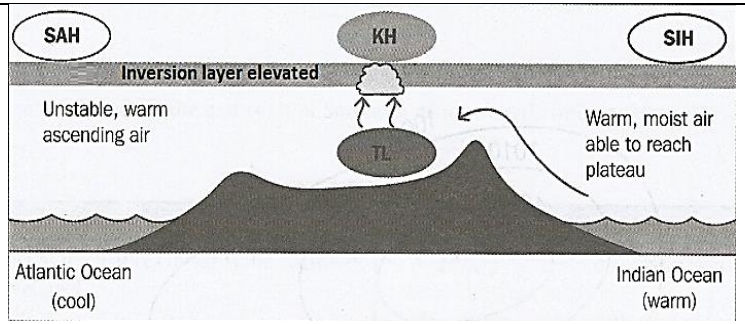


Figure 38 Air circulation in January (highly simplified)

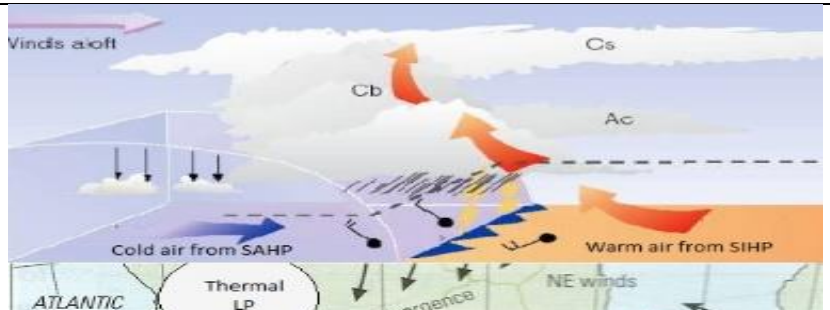
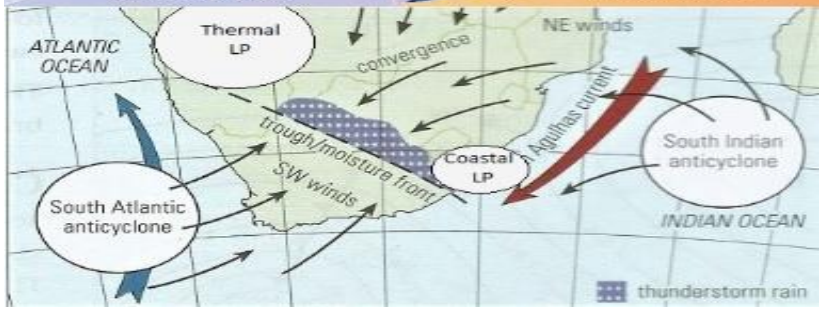


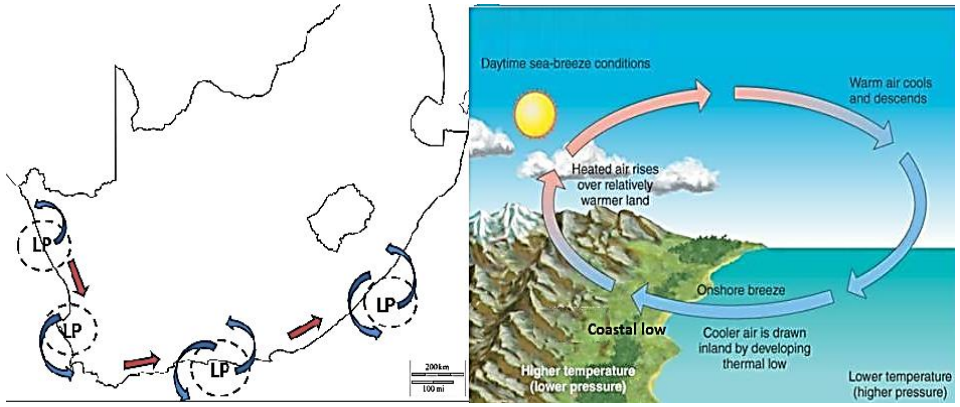
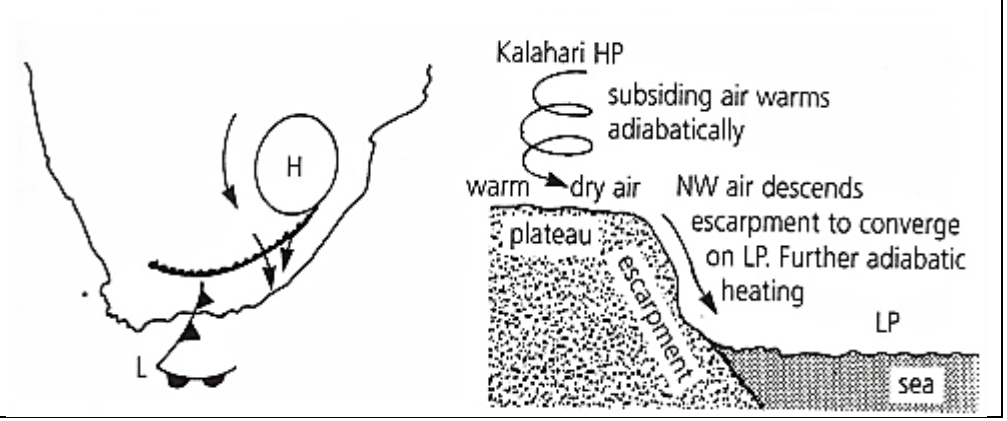
E. IMAGES, SYNOPTIC WEATHER MAPS AND ASSOCIATED WEATHER PATTERNS

	WINTER CONDITIONS	SUMMER CONDITIONS
PLAN / TOP VIEW		
CROSS SECTION		

ASSOCIATED WEATHER	**Winter:** • Anticyclones are in their northerly position and allow cold fronts to affect the country. • Mid-latitude cyclones move closer to the Southern Coast • Frontal rainfall over South Western Cape • Interior is cool, dry because of dominance of Kalahari Anticyclone • Dry Inversion is formed below the escarpment • Pressure system rests on escarpment and prevents warm air from the Indian Ocean to reach the interior • conditions and clear skies over the interior Berg wind conditions	**Summer:** • Anticyclones are in their southerly position and generally prevent the cold fronts from reaching the South Africa • Kalahari Anticyclone is not present on the surface but located in upper air • Warm air rises and forms thermal LP which are associated with convectional thunderstorms over interior • Warm, moist air moves in over the escarpment from north-east to bring rain in interior • Higher temperatures and humidity in the interior. • Cloud cover and rainfall over the interior • Moisture front and squall line thunderstorms develop

F. TRAVELING DISTURBANCES

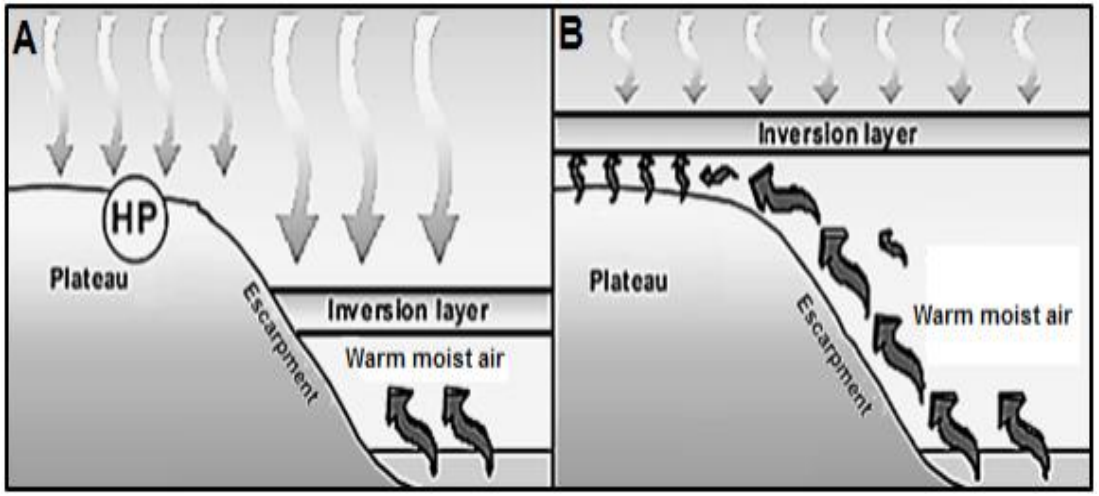
	MOISTURE FRONT AND LINE THUNDERSTORMS	
CROSS SECTION		
TOP VIEW		

CHARACTERISTICS	• Develop when a thermal/heat low pressure cell and a coastal low is located over South Africa • Low-pressure trough form and feeds moist air to the interior • Occurs in summer when the low pressure dominates the land • The moisture front develops where the cool dry air from the South West South Atlantic Anticyclone) meets the warm moist air from the North East South Indian Anticyclone. • The cool air lifts the warm air which cools, adiabatically, condenses and forms cumulonimbus clouds • No rain falls to the south west of the moisture front and is called the dry line	• Line thunderstorms develop along the moisture front/boundary • When a thermal low-pressure cell and coastal low is located over South Africa • Results in a low-pressure trough that feeds warm moist air to the interior from the northeast • It converges with cold, dry air from the southwest • Cold air lifts the warm air which cools adiabatically, condenses and forms tall cumulonimbus clouds • Associated with thunderstorms, heavy rain and possible hail • Can occur at night as it is not caused by heating of the atmosphere but convergence of two air masses with cold dry, dense air and warm, moist less dense air
IMPACT	**NEGATIVE** • Thunderstorms can cause damage in summer. • Hail, thunder and lightning can cause damage to property and crops • Torrential downpour can cause flooding	**POSITIVE** • Rainfall in interior is positive for crops • Most of the soil nitrogen are derived from lightning, so a thunderstorm can help to fertilize the soil.
	COASTAL LOW PRESSURE	**BERG WINDS**
DIAGRAM		

CHARACTERISTICS	• Develop during summer and winter over coastal regions. • The air moves in a clockwise direction around the cell • These low pressure sytems cause complete different weather on either side of the pressure cell. • On the one side of the pressure cell, air will move from the land to the sea and will cause warmer drier conditions (offshore winds) • On the other side of the pressure cell where the air moves from the sea to the land, moist cloudy conditions will develop that can lead to rain along the coastline (onshore winds) • LP systems moves from west to east along the coastline	• Occurs in winter • Gusty hot, dry winds • Berg wind conditions occur ahead of the mid latitude cyclone, • Air flows from the Kalahari High Pressure cell to the coastal low pressure • Air subsides from the plateau and down the escarpment (offshore winds) • Winds becomes warmer as it heats at Dry Adiabatic temperature lapse rate and become drier and hotter. • This causes hot dry uncomfortable conditions which is generally replaced quickly with cold conditions associated with the cold front.
IMPACT	**West coast**: • Onshore wind is cold and dry with limited moisture • Offshore wind is warm and dry with no moisture **East coast:** • Onshore wind is warm with moisture that results in coastal rainfall • Offshore wind is warm and dry with limited moisture	• It can result in the development of veld fires. • Veld fires impact natural environment, humans and animals • Farmers may lose houses, equipment and livestock • Natural bush and grazing may be lost • Animal habitats may be destroyed • Dry, warm conditions can cause heat stroke and discomfort • People and animals can suffer from dehydration

ACTIVITY 1.3 SUB-TROPICAL ANTICYCLONES

1.3 FIGURE 1.3 is a diagram showing the influence of the plateau on South Africa's climate.



[Source: https://www.google.co.za'search?inversion]

1.3.1 Does sketch A or sketch B indicate a winter condition? (1 x 1) (1)

_____

1.3.2 Give evidence from the sketch to support your answer to QUESTION 1.3.1. (1 x 1) (1)

_____

1.3.3 How does the inversion layer form in sketch A? (1 x 2) (2)

_____

_____

1.3.4 Account for the change in the position of the height of the inversion layer in sketch B. (2 x 2) (4)

_____

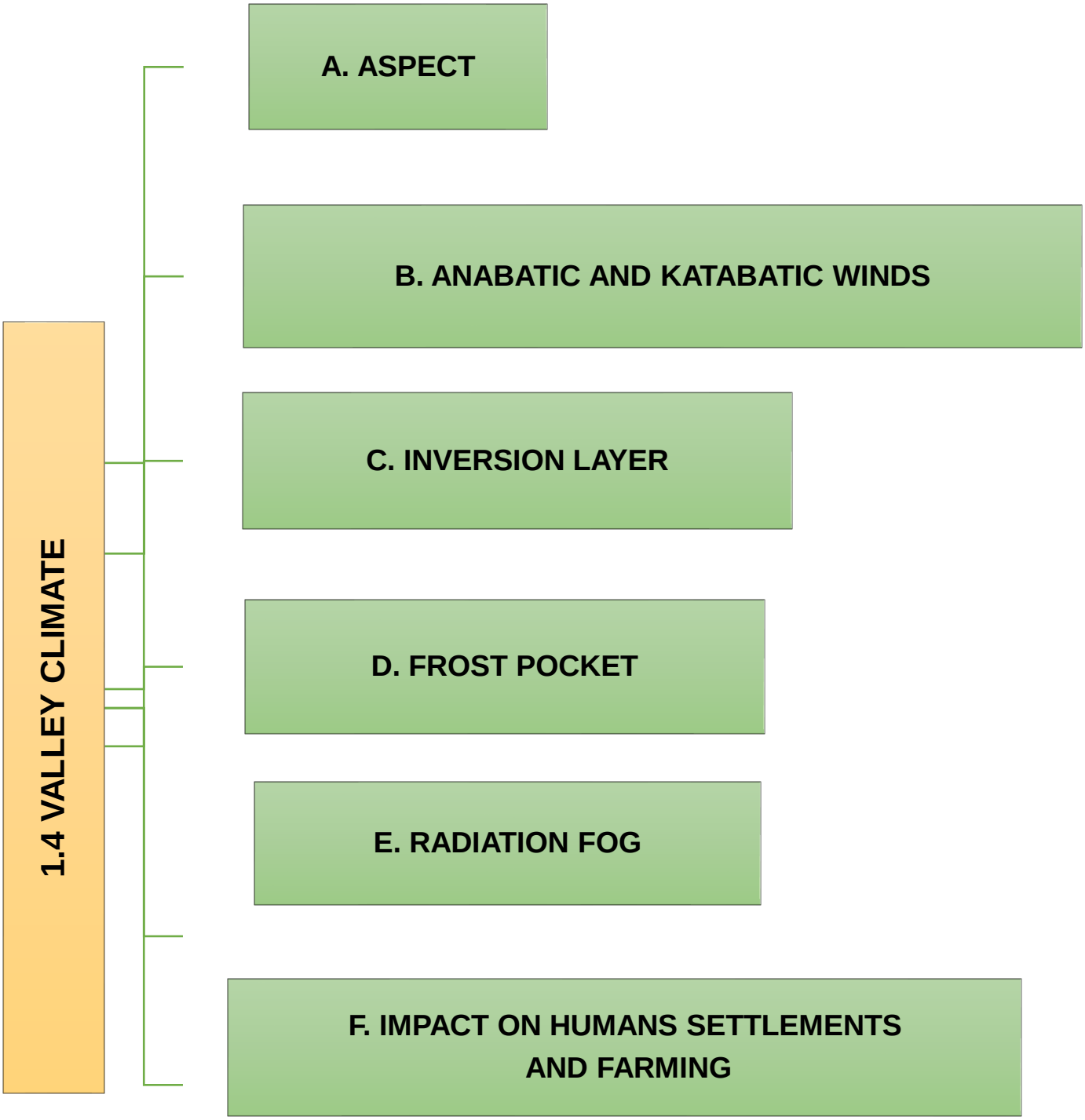
_____

1.3.5 Write a paragraph of approximately EIGHT lines explaining how the changing position of the height of the inversion layer over the plateau influences the climate in the interior of South Africa during summer and winter. (4 x 2) (8)

_____

_____

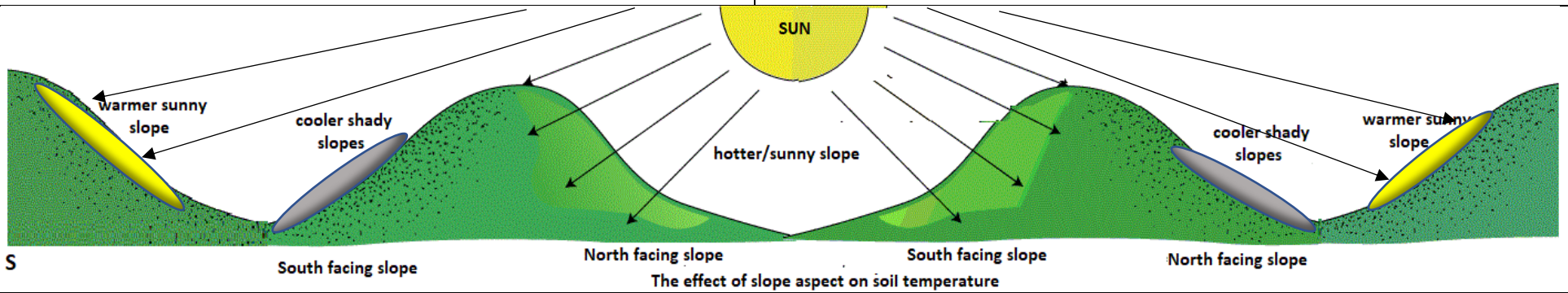
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1.4 VALLEY CLIMATE
A. ASPECT
B. ANABATIC AND KATABATIC WINDS
C. INVERSION LAYER
D. FROST POCKET
E. RADIATION FOG
F. IMPACT ON HUMANS SETTLEMENTS AND FARMING

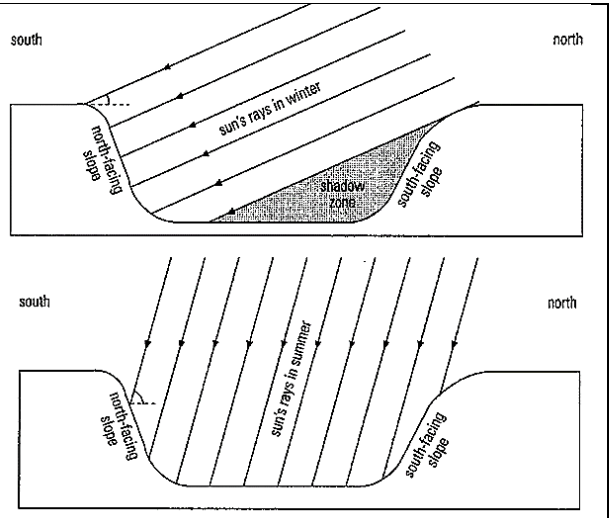
1.4 VALLEY CLIMATES

Microclimate: The climate of a small area that is different to the climate of its surroundings. Three factors contribute to valley microclimate

A SLOPE ASPECT: Orientation of the slope

<table>
<tr><td></td><td colspan="2">SOUTHERN HEMISPHERE</td><td>NORTHERN HEMISPHERE</td></tr>
<tr><td>CROSS SECTION</td><td colspan="3">

The effect of slope aspect on soil temperature</td></tr>
<tr><td></td><td colspan="2">IN THE SOUTHERN HEMISPHERE</td><td rowspan="2">Impact change during winter and summer because of the:
Migration of pressure systems
Angle of incomming sun</td></tr>
<tr><td>ASSOCIATED WEATHER</td><td>North facing slopes:
north-facing slopes are hot, sunny and drier
Receive more direct Sun’s rays
Smaller surface area heated thus warmer
Soils are warmer as they are in the sunny zone.
Farmers have to select a slope which is best suited for certain crops.
Warmer part of valley is called the thermal belt
The effect of aspect is greater in the winter and in places further from the equator</td><td>South facing slopes:
South-facing slopes are cool, shady and retain moisture
Soils are cooler on the south-facing slopes as they are on the shadow zone.
Area in shadow zone on the south facing slope are heated only by reflection</td></tr>
</table>

IMPACT	• Humans tend to build their houses on north-facing slopes because they are warmer. • Crops that require less moisture and more sunlight will grow on the north facing slopes • Too cold for humans to build settlements • Trees and shade loving plants such as ferns will grow on the south facing slopes	

B. ANABATIC AND KATABATIC WINDS

	ANABATIC WINDS AND KATABATIC WINDS

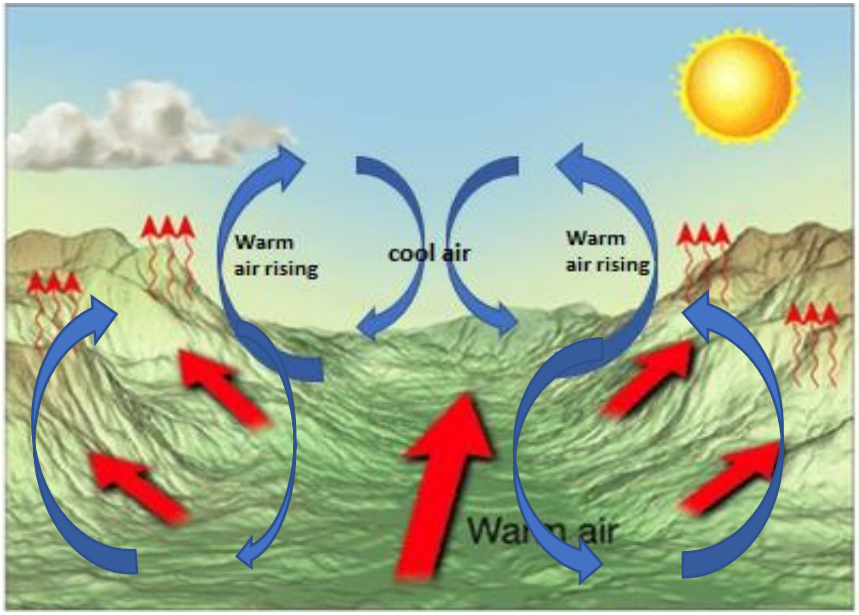
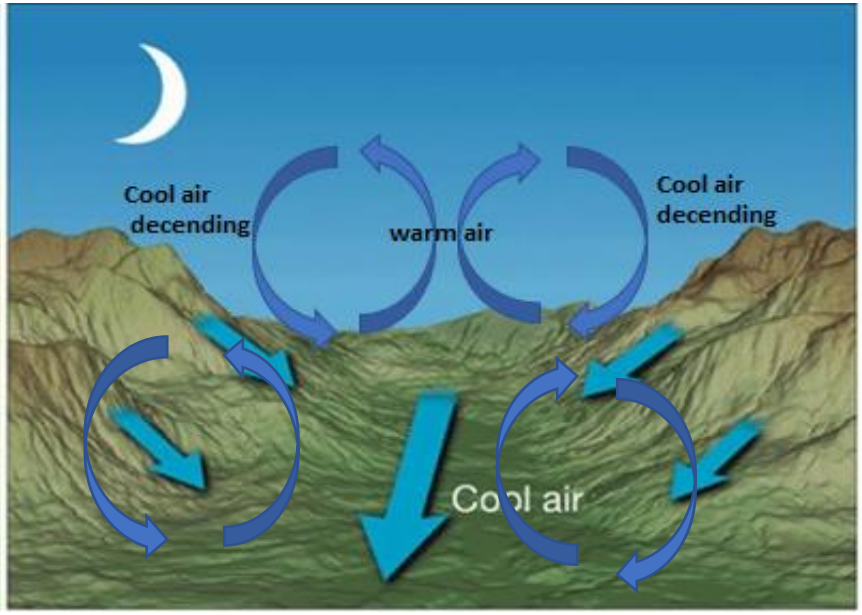
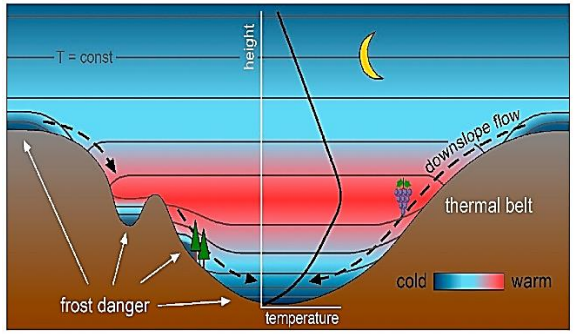
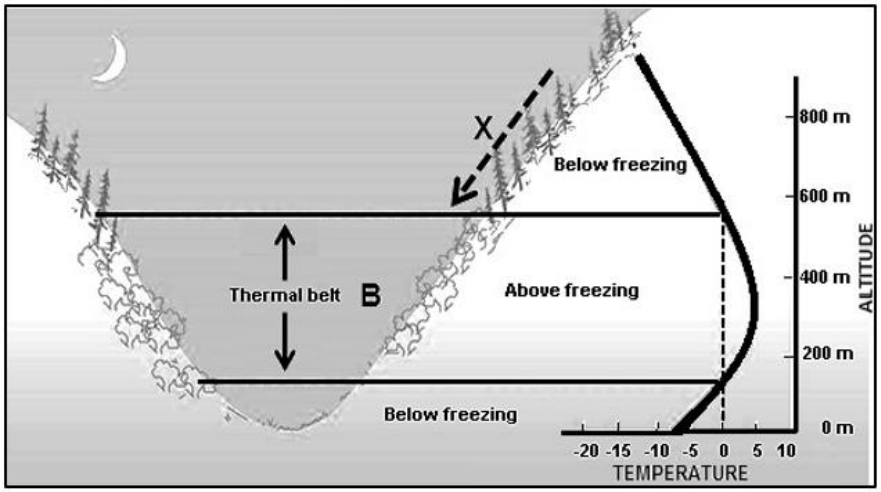
CROSS SECTION		
CHARACTERISTICS	• The air above the slopes warms, becomes lighter and rises the slopes of the valley • This is a warm wind which blows up a steep slope or mountain side, driven by heating of the slope through insolation. • Occur during the day when the slopes warm due to insolation.	• The air above the slopes becomes cold and dense and sinks down the valley sides/slopes. • This is a wind that carries high density air from a higher elevation down a slope under the force of gravity. • Occurs at night when the slopes cool due to terrestrial radiation.
IMPACT	• Rising air remove any pollution in the valley to higher altitudes	• Descending air is cold and capture the pollution on the valley floor which can result in the development of smog
	C. INVERSIONS	**D. FROST POCKETS** / **E. RADIATION FOG**

DIAGRAM			
CHARACTERISTICS	• Occurs during calm, cold and clear winter's night. • When cold air drains down the valley slopes and collects at the bottom of the valley • Warm air is displaced upwards to form an inversion layer in the mid-valley • It is a layer of warm air trapped between two layers of cold air • Layer is called the thermal belt • Can lead to the formation of acid rain which corrode buildings and damage crops	• Low-lying area e.g. a valley bottom where frosts occur more frequently than in the surrounding area. • This is normally after a dry, clear and cold night • Cold air drains down neighbouring slopes • If dew point temperature is below freezing point, it condenses to ice crystals • Forming frost pockets where the cold air collects.	• On cold, clear cloudless nights when terrestrial radiation occurs rapidly • The ground become cool at night • The air above the ground also cools • When this air is below due point temperature, it causes water vapour to condense around the dust and other particles in the atmosphere to create radiation fog. • In the morning the sun's rays heat the surface • The warm air rises and evaporates • Combined with pollution in the atmosphere it forms smog
	ENVIRONMENT		**HUMAN**
F. MPACT	• Traps pollutants, this will differ depending on the activity in the area e.g. industries result in more pollutants being trapped. • Acid rain occurs • Damages fauna and flora • Decreases visibility • Effects people health e.g. respiratory illnesses.		• Effect farmers if frost sensitive crops are grown on the valley floor • Damages vegetation and crops • Could plant frost resistant crops. • Frost pocket can cause people to settle mid-slope in the thermal belt • Smog results in poor visibility and is a health hazard • Can cause traffic accidents

ACTIVITY 1.4 VALLEY CLIMATE

1.4 Study FIGURE 1.4 showing a diagram on valley climates

FIGURE 1.4: VALLEY CLIMATES



1.4.1 Is the slope wind at X an anabatic or a katabatic wind? (1 x 1) (1)

_____

1.4.2 Other than the label, what evidence indicates that B is the thermal belt? (1 x 1) (1)

_____

_____

1.4.3 What is the term used to describe an increase in the temperature as the height increases in the valley? (1 x1) (1)

_____

1.4.4 Explain why slope wind X will be more intense in winter. (2 x 2) (4)

_____

1.4.5 Account for the low temperature that is likely to be experienced on the valley floor during winter. (2 x 2) (4)

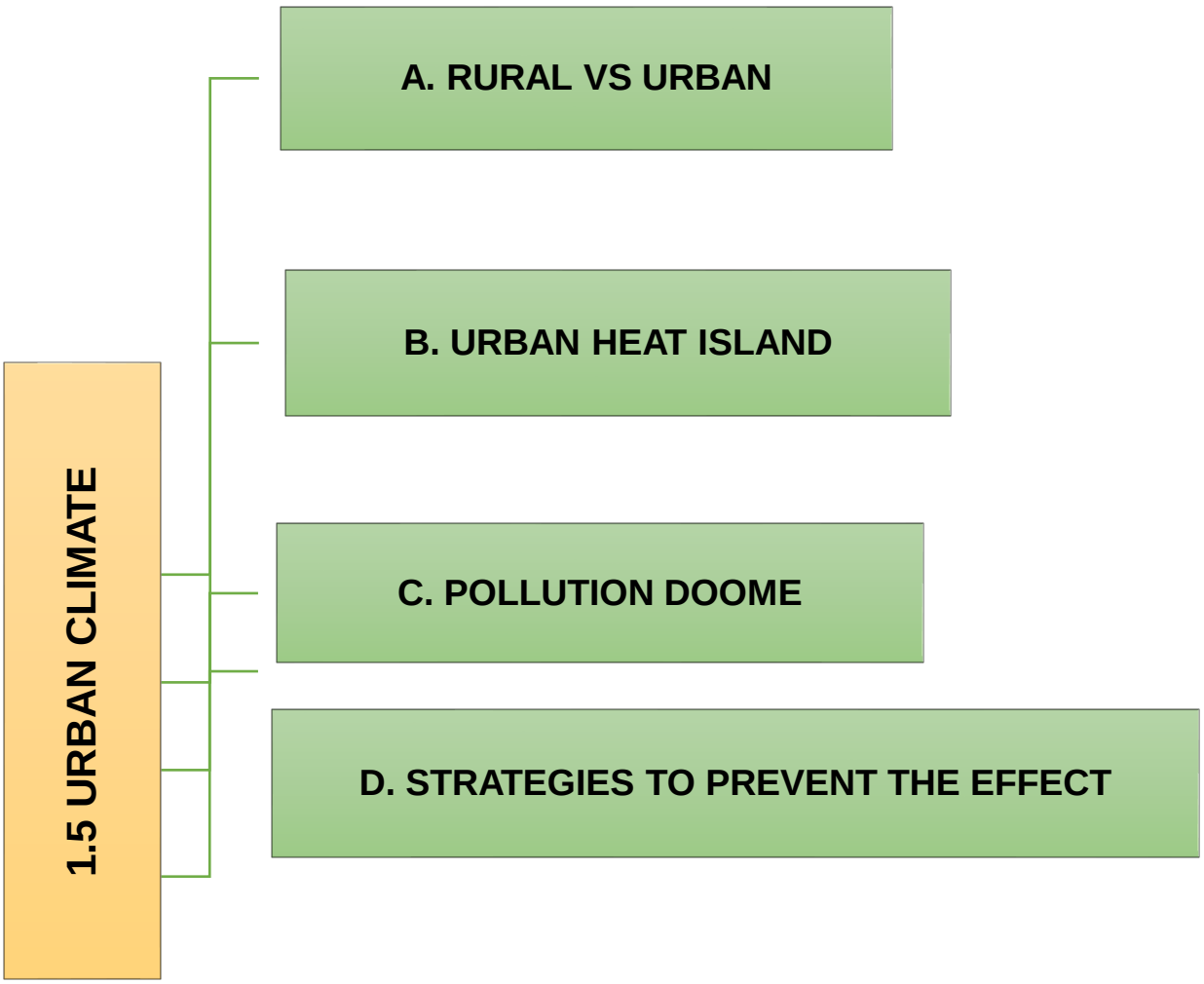
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1.4.6 How will farmers have to adapt their farming techniques (methods) due to the temperature change on the valley floor? (2 x 2) (4)

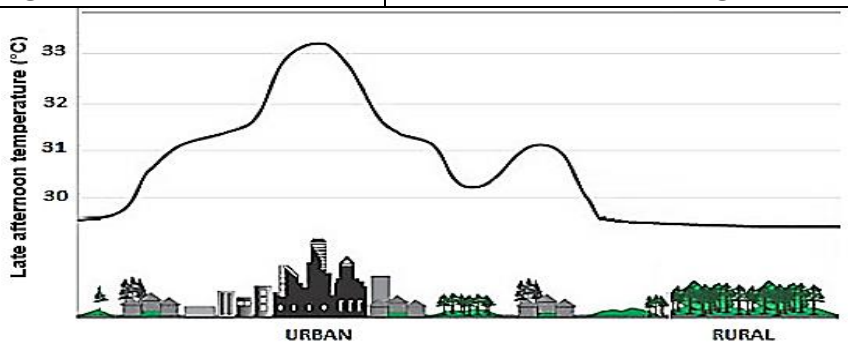
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1.5 URBAN CLIMATE
A. RURAL VS URBAN
B. URBAN HEAT ISLAND
C. POLLUTION DOOME
D. STRATEGIES TO PREVENT THE EFFECT

1.5 URBAN CLIMATE

A. RURAL VS URBAN CLIMATE

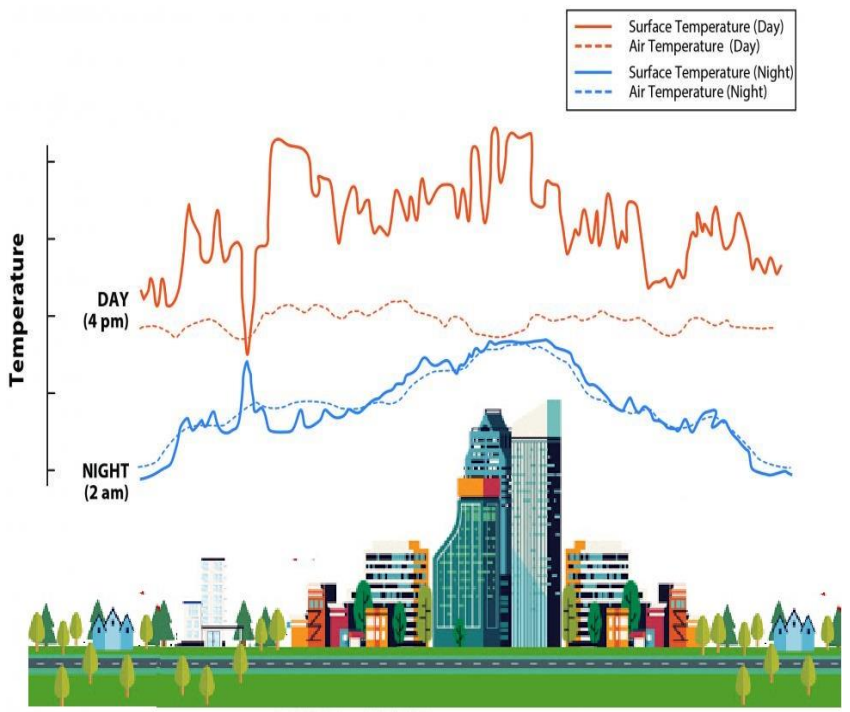
	URBAN	RURAL
CROSS SECTION		
CLIMATE CONDITIONS	**TEMPERATURE**	
	• Warmer due to lack of vegetation • More artificial heating, air conditioning, vehicle emissions • More artificial surfaces, tar, concrete • More dust and pollution prevent heat escaping	• Cooler due to fewer artificial surfaces and more vegetation cover
	POLLUTION	
	• More pollution and dust due to industrial activities, combustion processes and traffic	• Less pollution and dust particles
	CLOUD COVER	
	• More clouds form as there are more dust and pollution particles in the atmosphere	• Fewer clouds
	PRECIPITATION	
	• More rain and hail due to more hygroscopic nuclei in the atmosphere and strong updrafts • Warmer temperature causes more evaporations and snow to melt	• Less rain and hail but there may be more snow
	RELATIVE HUMIDITY	
	• Lower evaporation and relative humidity due to lack of vegetation cover and natural resources • Less surface water to evaporate • Warmer air can hold more moisture	• Higher relative humidity due to water retention in soil and vegetation
	WIND SPEED	
	• Wind speed is less as buildings creates friction and acts as windbreaks • Greater turbulence because wind is channelled between buildings	• Wind speed is higher, and Turbulence is less due to open space
	FOG AND VISIBILITY	
	• More fog and poorer visibility due to more hygroscopic nuclei in atmosphere • Fog is a problem in winter when temperature inversion trap pollutants close to Earth's surface • Smog causes traffic accidents and health related problems	• Less fog resulting in better visibility

	AIR PRESSURE	
	• Lower because of warmer temperature	• Higher because of lower temperature

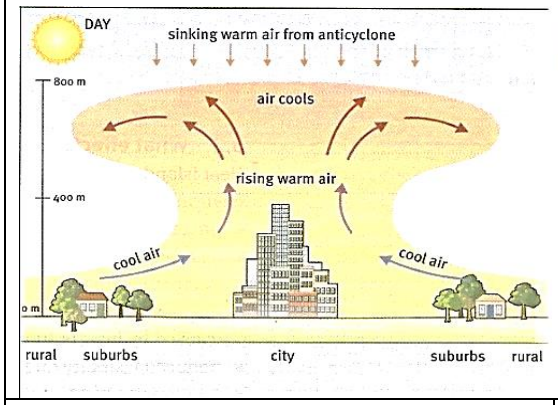
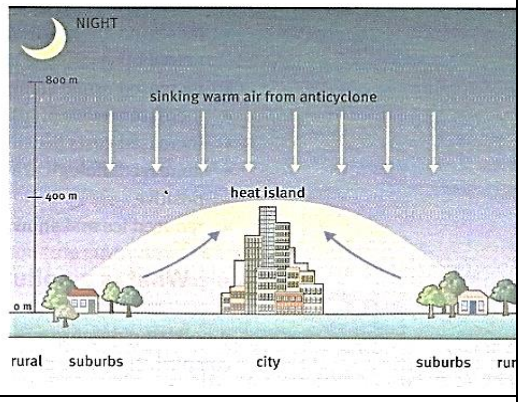
B. URBAN HEAT ISLANDS

CROSS SECTION

Urban heat island: The temperature over the city is warmer that the surrounding rural area



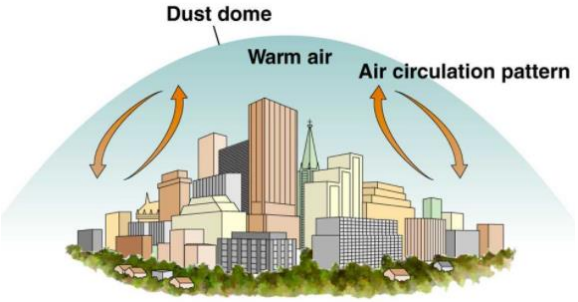
CHARACTERISTICS

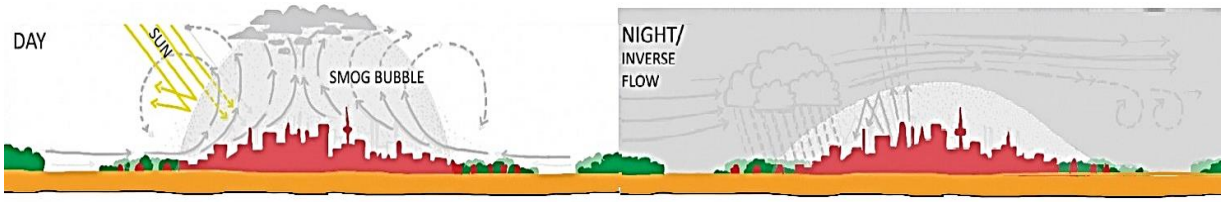
DAY	NIGHT
	
• Heating cause the air to expand and rise so the heat island grows vertically • The inversion layer is elevated vertically	• It is cooler so the air becomes denser and sinks • The heat island is more dome shaped and pollutants are more concentrated • The inversion layer is closer to the surface • The trapped heat is more concentrated over CBD area

C	CAUSES		ENVIRONMENT	HUMANS

	• Artificial surfaces in urban areas: glass, Concrete, stone, brick, tarmac, iron, • Increased surface area that can heat – roof and sides of buildings • Production of artificial heat: factories, ovens, air-conditioning units, vehicle emissions	**EFFECT**	• Surfaces absorb heat during the day and radiate heat into the environment at night • Glass radiates heat back into the atmosphere • Increase of urban smog due to higher urban temperature • Increase in the evaporation rate • Combustion of factories produce heat • Specialized ovens and heating units release heat • Air-conditioning units' release warm air into the environment • Emissions by vehicles release heat and air pollution	• Increase discomfort • Exacerbated heat stress and deaths during heat waves • Reduce visibility because of smog • Increased costs because of greater water and energy use

C. POLLUTION DOMES

<table>
<tr><td rowspan="3">CROSS SECTION</td><td>Pollution dome: When dust, soot and chemical emissions are trapped in the warm air of a heat island the dome becomes a pollution dome


Pollutants act as hygroscopic nuclei and attract water vapour to them, and fog develop.
Smog: A mixture of smoke and fog</td><td colspan="2">DAY | NIGHT

</td></tr>
<tr><td colspan="2">• Convection of warm air in the centre of the city cause a LP cell to form
• Warm air rises vertically and cool down and diverges in the upper air to spread outward to the rural areas
• Air circulating in the dome spread the pollution vertically and it is more disperse
• Pollution is carried away by upper air divergence
• Cooler air flows into the LP cell from surrounded rural area</td><td>• Cooler air at night results in pollution dome developing closer to the surface
• This results in the pollution being dense and cannot escape the city
• Pollution is more concentrated because of inversion layer closer to the earth and pollution cannot escape the dome</td></tr>
<tr><td colspan="2">CAUSES</td><td>EFFECTS</td></tr>
</table>

• Vehicle exhausts – carbon monoxide And nitrogen oxide • Burning of fossil fuels – carbon dioxide and sulphur oxide • • The pattern of air circulation and high levels of air pollution in the city	• Smog cause health problems e.g. lung infections, asthmatic attacks • Smog reduces visibility and accidents • Increase of cloud cover and precipitation • Acid rain develop which kill trees and eats away bricks and stone. • Lead poisoning may result in petrol fumes • Old paint peeling off buildings

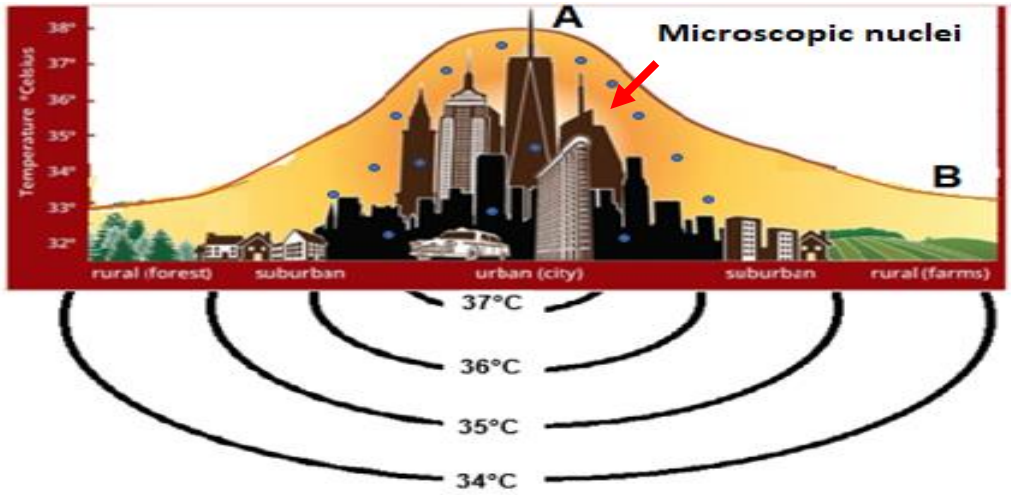
D. STRATEGIES

- Make surfaces lighter colour to be more reflective and less absorbent.
- Greening cities by planting trees in gardens, down streets and in parks
- Trees increase transpiration which decrease air temperature.
- Building restrictions on hight and materials used in building projects
- Invest in energy saving strategies
- Develop sustainable public transport
- Trees reduce energy costs
- Controlling the amount of pollution from factories

ACTIVITY 1.5 URBAN CLIMATE

1.5 Refer to FIGURE 1.5 based on the differences between rural and urban climates.

.



1.5.1 Will **A** or **B** generally experience lower wind speeds? (1 x 1) (1)

_____

1.5.2 What evidence in the photograph indicates that **A** experiences higher evaporation rates than **B**? (1 x 2) (2)

_____

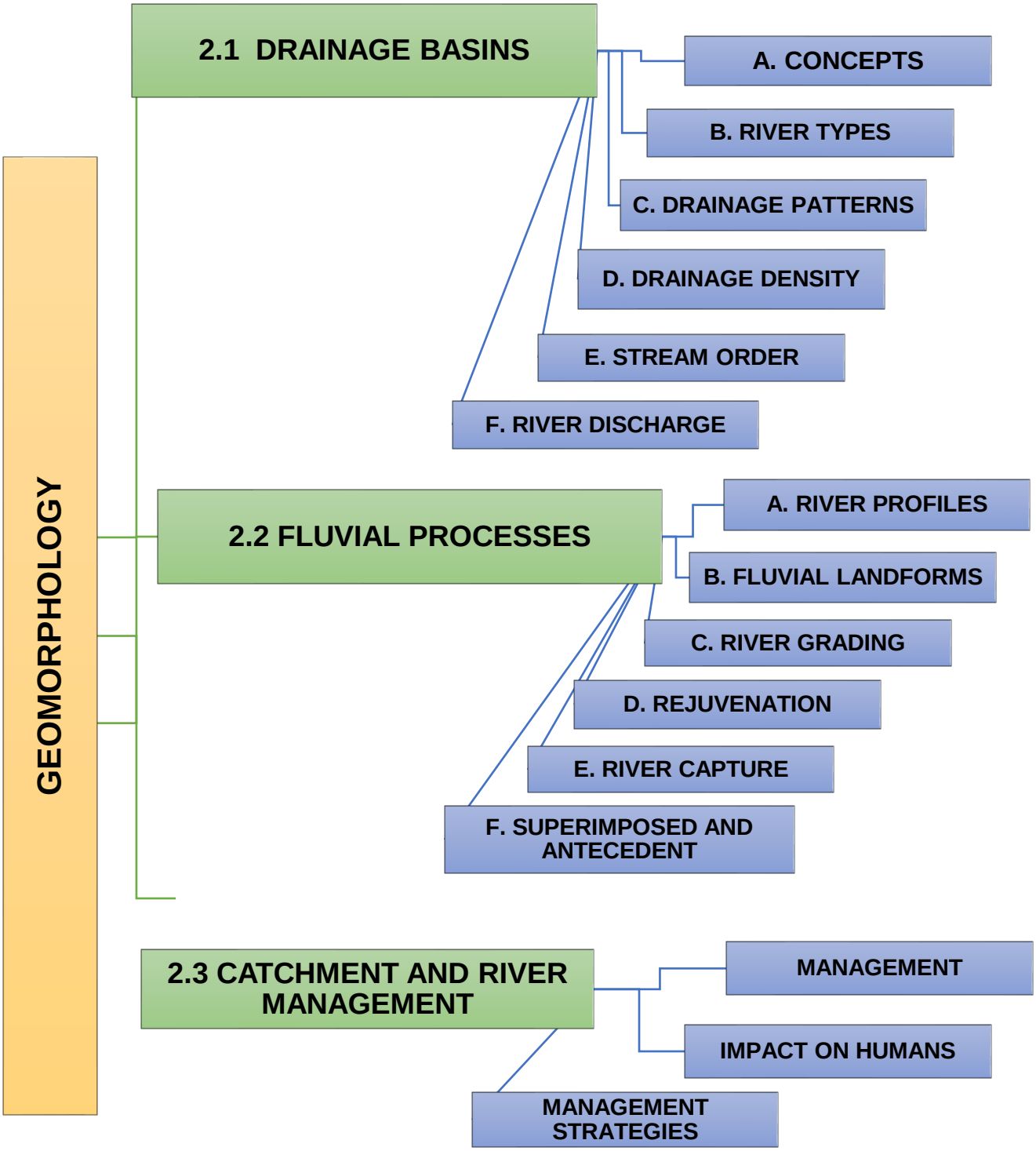
_____

1.5.3 Why does **B** experience more frequent rainfall than **A**? (1 x 2) (2)

_____

1.5.4 Explain how the geometric shape of the buildings in the city causes a greater absorption of heat. (1 x 2) (2)

1.5.5 In a paragraph of approximately EIGHT lines, discuss how artificial surfaces and urban activities contribute to higher temperature recordings in **B**. (4 x 2) (8)


GEOMORPHOLOGY
2.1 DRAINAGE BASINS
A. CONCEPTS
B. RIVER TYPES
C. DRAINAGE PATTERNS
D. DRAINAGE DENSITY
E. STREAM ORDER
F. RIVER DISCHARGE
2.2 FLUVIAL PROCESSES
A. RIVER PROFILES
B. FLUVIAL LANDFORMS
C. RIVER GRADING
D. REJUVENATION
E. RIVER CAPTURE
F. SUPERIMPOSED AND ANTECEDENT
2.3 CATCHMENT AND RIVER MANAGEMENT
MANAGEMENT
IMPACT ON HUMANS
MANAGEMENT STRATEGIES

GEOMOFPHOLOGY CONCEPTS

Base flow: The flow of groundwater in the same direction as the river
.

Base level: The lowest level to which a river can erode.

Condensation: When water vapour reaches dew point temperature and changes into water droplets.

Deposition: When a river deposits (lays down) the sediment it is carrying on the riverbed.

Drainage basin: An area drained by a river system.

Erosion: The removal of soil and wearing away of rocks by wind, water, or ice.

Evaporation: When water in the liquid form is converted (changed) into water vapour (gas).

Fluvial hydrographs: Show runoff of a river at particular time at a point on a river.

Groundwater: Water stored below the ground in soil and rock.

Headward erosion: When a river cuts back towards its source.

Infiltration/percolation: A process whereby water seeps into the soil or rock.

Interception: The process by which raindrops are prevented from falling to the ground by plant leaves, stems and branches.

Perennial river/permanent river: River that flows throughout the year.

Precipitation: Any form of water falling from the sky (e.g. rain, hail, snow).

Rejuvenation: The renewal of erosion activity in a river.

River/channel flow: Water that flows within a river channel.

River discharge: The volume of water that flows past a point in a river in a given time.

River meander: A series of bends in a river as it moves along the floodplain.

River source: This is where a river starts; normally high up in mountainous areas.

River mouth: This is where a river ends; normally when it reaches the sea or ocean.

Runoff/overland flow: Rainwater which runs overland towards a river, lake or the sea.

Seasonal/periodic/non-perennial river: River that only flows during the rainfall season.

Stream capture/piracy: When one river 'robs' another of its water.

Stream channel: Where the water flows in a river (riverbed).

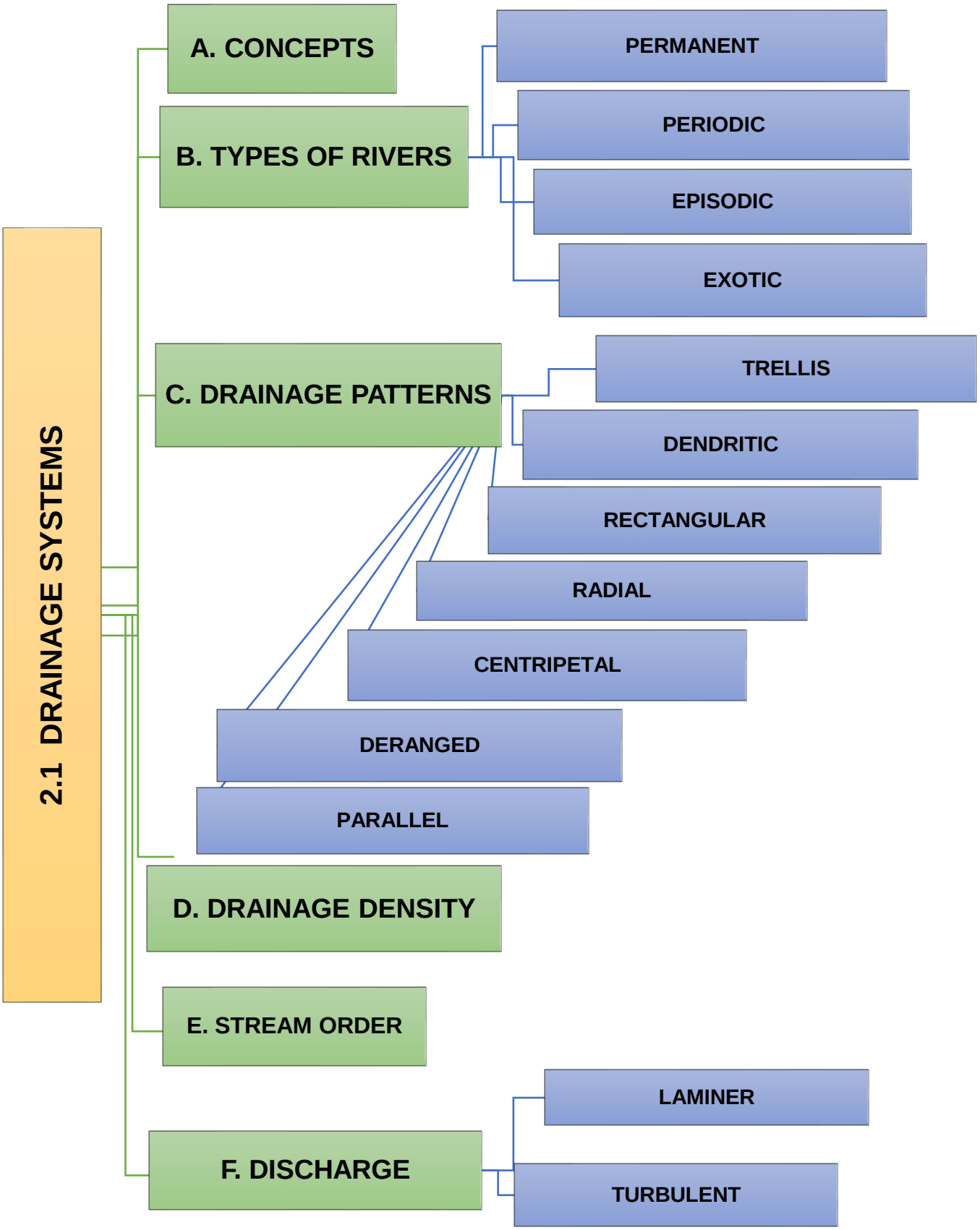
Throughflow: The movement of groundwater through the soil due to gravity.

Transpiration: Water vapour is released from leaves in trees and plants.

Tributary: A smaller river which flows into (joins) a larger river.

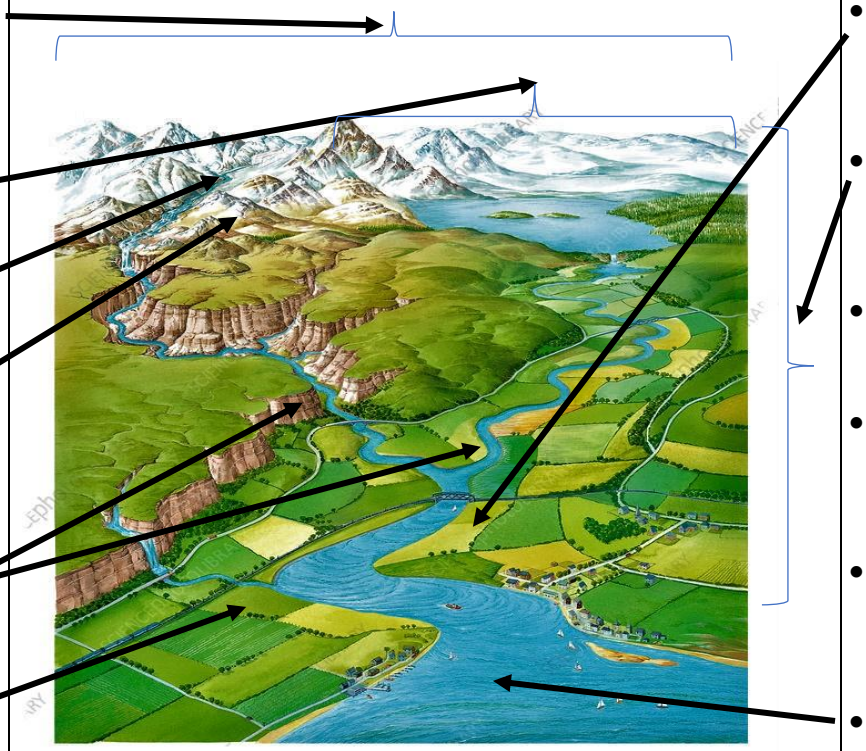
Watershed/Drainage divide: High-lying land separating drainage basins.

Water table: The level below which the ground is saturated (it can hold no more water).


2.1 DRAINAGE SYSTEMS
A. CONCEPTS
B. TYPES OF RIVERS
PERMANENT
PERIODIC
EPISODIC
EXOTIC
C. DRAINAGE PATTERNS
TRELLIS
DENDRITIC
RECTANGULAR
RADIAL
CENTRIPETAL
DERANGED
PARALLEL
D. DRAINAGE DENSITY
E. STREAM ORDER
F. DISCHARGE
LAMINER
TURBULENT

2.1 DRAINAGE SYSTEM: CONCEPTS

- **Catchment area:** The area contributing surface water to a point on a drainage or river system, which may be divided into sub-catchments.
- **Drainage basin:** Area drained by the mainstream and its tributaries
- **Source:** The origin of a river in the catchment area
- **Watershed:** High ground separating one drainage basin from another drainage basin next to it
- **Tributary:** Individual river channels forming the stream network
- **Surface run-off:** Rainwater that runs off the surface of the Earth without infiltrating the soil.

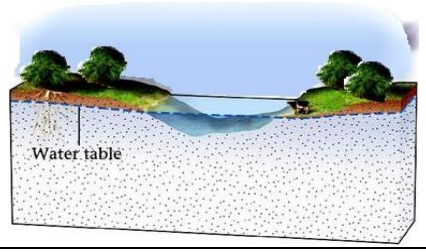


- **Confluence:** The point where two streams meet along the course off a river
- **River System:** Number of individual channels that joined together
- **Water table:** The upper level of the saturated ground water zone
- **Groundwater:** Water that is stored underground in soil and rock
- **Discharge:** The volume of liquid flowing through a cross-section of conduit per unit of time.
- **River mouth:** The point at which the river enters the sea

B. TYPE OF RIVERS

PERMANENT

- Receive water all year
- Watertable always lies above the bed of the river



PERIODIC

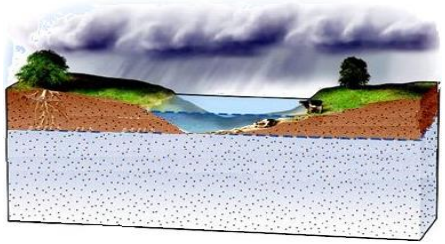
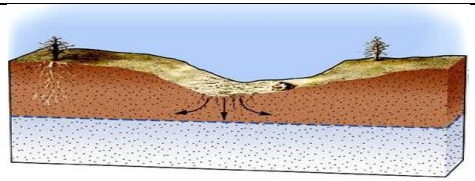
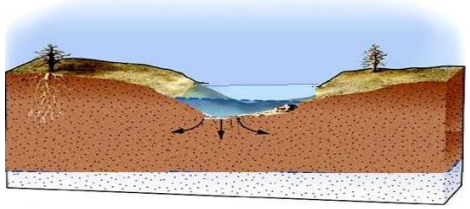
- Receive water only in rainy season
- Watertable only above the riverbed in rainy seasons

EPISODIC

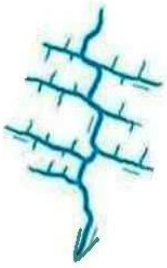
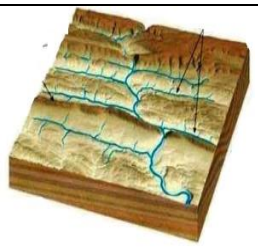
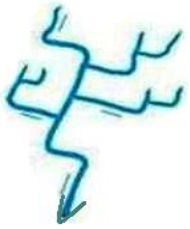
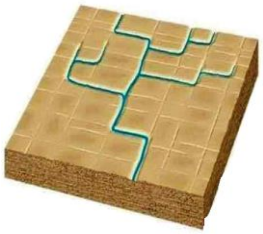
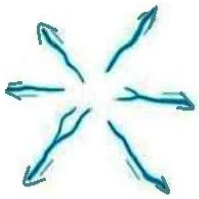
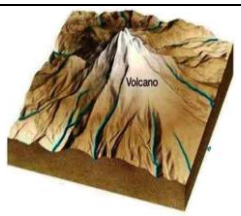
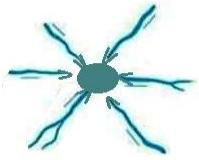
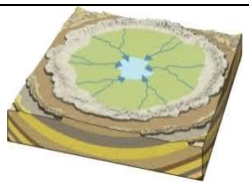
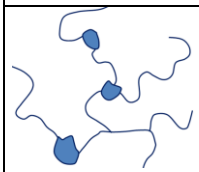
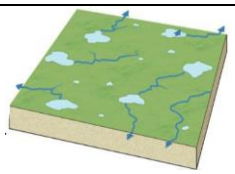
- Receive water only after a heavy downpour (flash flood)
- Watertable always beneath the riverbed, never supplied with groundwater

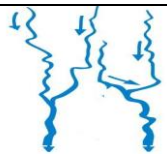
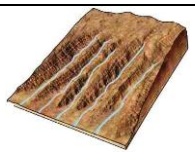
EXOTIC

- Flows through arid regions
- Receives water from rainfall areas
- Permamanent rivers
- Does not contribute to baseflow in these arid regions

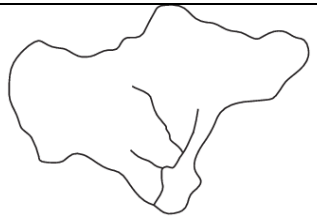
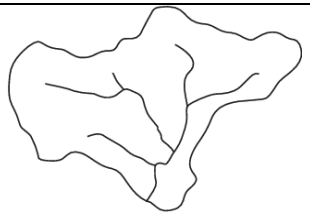
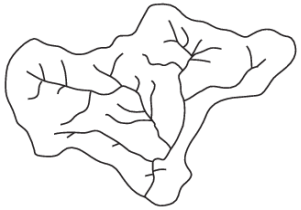
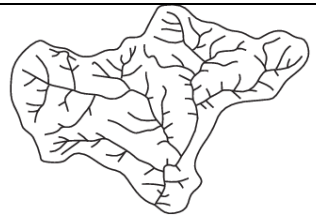
				

C. DRAINAGE PATTERN: Drainage pattern is the pattern formed by the streams, rivers, and lakes in a drainage basin.

STREAM PATTERN		DESCRIPTION	CONDITIONS
DENDRITIC			
		• Tree shaped • Tributeries join at an acute angle • Distinct interfluves	• Undelying rock types uniformly resistant to erosion • Horizontal sedementary or massive igneous rocks • Not dependent on topography and geology of area
TRELLIS			
		• Prominent ridges parallel to each other • Short tributeries • Tributeries join main stream at right angles • Main river cut parallel through ridges	• Dependent on topography and geology of area • Alternate layers of hard and soft rock • Layers are often inclined or folded • Main river forms poorts and gaps
RECTANGULAR			
		• An angular pattern develops along joints • Surface water flows along the exposed joints • Sharp angles in main stream	• Well-jointed rock outcrops • Igneous rocks such as granite • Joints exposed at the surface, which erode easily
RADIAL / CENTRIFUGAL			
		• Streams radiate outward from the central high lying area (hilltop) • Looks like the spokes of a wheel	• Formed by the topography of the area • Develops on dome-shaped features
CENTRIPETAL			
		• Streams flow towards a depression or lake •	• Areas where there are depressions or low lying swampy areas • Relief of the area determines the pattern
DERANGED			
		• Haphazard pattern • Numerous swamps, meander scars, oxbow lakes may form	• Geologically young areas • Surface rocks are unconsolidated • Sediments accumilated recently

PARALLEL			
		• Rivers flow parallel to each other • Few streams follow direction downslope	• Uniform resistant slopes • Steep slopes

D. DRAINAGE DENSITY: The average length of streams within an area of a drainage basin / Average number of tributaries in an area

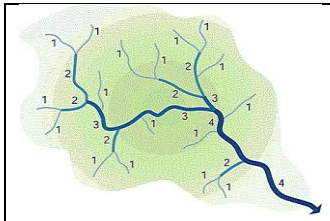
	LOW DENSITY	MEDIUM DENSITY	HIGH DENSITY	EXTREMELY HIGH
DIAGRAM				
	• Few streams flowing in the drainage area • Coarse texture	• More streams flowing in the drainage area • Medium texture	• Many 1st and 2nd order streams in drainage area • Finer texture	• Many small streams • Very fine texture

FACTORS INFLUENCING DRAINAGE DENSITY: Density is dependent on the amount of runoff in the drainage basin

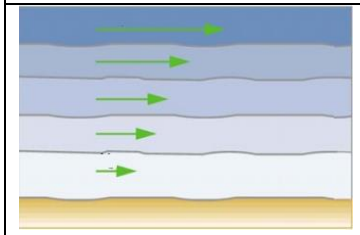
- ❖ Runoff differs with normal flow: Differs from season to season and annually. Will impact number, order, and drainage density
- ❖ Flooding flow: Will result in higher number, order, and drainage density
- ❖ Drought flow: Small streams will cease to flow and result in lower number, order, and drainage density

	PERMEABILITY	GRADIENT	CLIMATE	VEGETATION COVER
Influence	***Type of rock and soil cover:*** • High permeability (Sandstone): results in high infiltration rate and low density • Low permeability (Clay): results in low infiltration rate and high density	***Steepness of area:*** • Steep slope: more runoff (tributaries) results in high density • Gentle slope: more infiltration and less runoff results in low density	***Amount and type of rainfall:*** • Arid regions with little rainfall: periodic rivers, less runoff which results in low density • Humid regions with high rainfall: permanent rivers, more runoff which results in high density	***Area and type of vegetation cover:*** • Forested areas: more infiltration and slower runoff results in low density • Limited vegetation cover; less infiltration and more runoff results in high density

E. STREAM ORDER: Number given to a segment of a river to indicate the interconnectedness of tributaries in river system

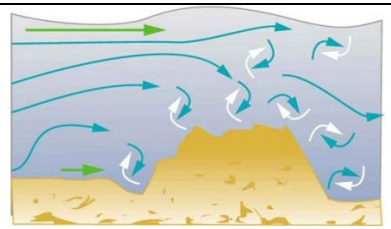
	***Ranking system:*** • First-order streams: No tributaries • Second-order streams: When two first-order streams join • Third-order streams: When two second-order streams join	***Relationship between order and factors influencing it:*** • The lower the order, the grater the number of segments • The lower the order, the shorter the length of stream • The lower the order, the steeper the gradient • The lower the order, the greater the total length of the segments

F. DISCHARGE: The amount of water passing a point in a certain amount of time measured in cumecs (cubic meters per second)



LAMINAR FLOW

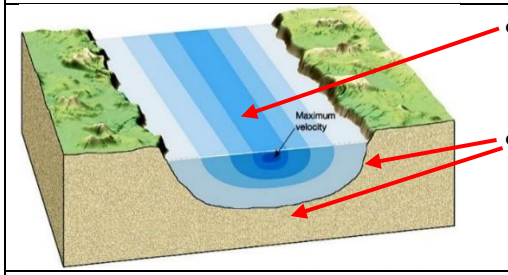
- Riverbed is level and even
- High speed but less erosion
- Water flows in layers
- Water in contact with the bed and banks slows down due to friction
- Greatest speed - middle just below the surface



TURBULENT FLOW

- Riverbed is uneven and steep
- River continually changes level
- Bubbling action
- Water flows slower but has more erosion because of uneven riverbed

VELOCITY OF WATER IN A RIVER:



- Water flows faster in centre because of less friction
- Water flows slower at the riverbanks and riverbed

INFLUENCED BY

- **Gradient:** Steep gradient flows faster as less water is slowed by friction
- **Volume**: Higher volume achieved faster speed as less water is slowed by friction
- **Channel shape**: deeper channel achieve greater speeds as there is less friction
- **Channel roughness**: Uneven riverbed has more turbulence and therefore less speed

TRANSPORTATION OF RIVER'S LOAD

Stream capacity: The maximum load that a river can transport in relation to

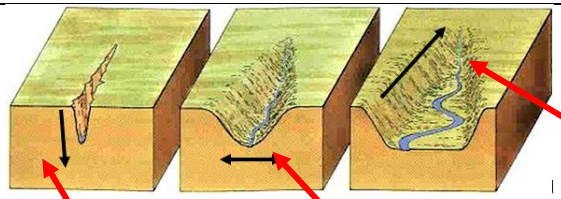
- Speed of the river
- Volume of the river
- Size of the particles carried by river

A river that flows quickly and has great volume can carry a greater load

TRANSPORTATION METHODS

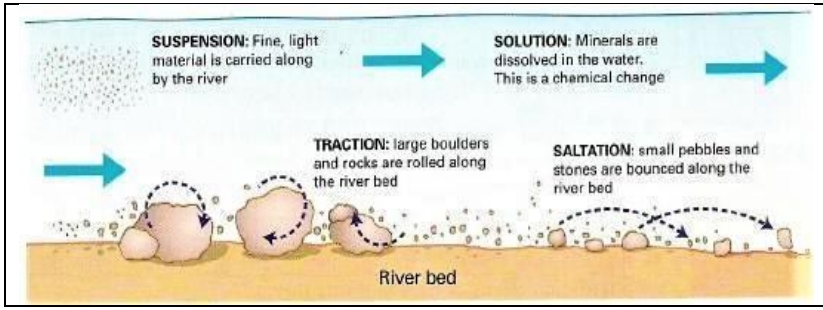
EROSION BY A RIVER

PROCESS AND



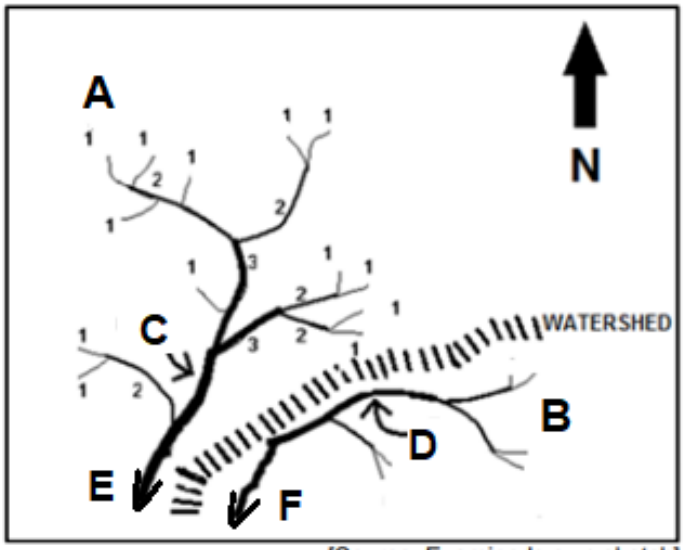
River needs energy to transport load to overcome friction and to flow. Excess energy will erode channel in form off:

Vertical erosion: Erosion of the bed causes channel to become deeper	**Lateral erosion:** Erosion of the sides of the channel causes channel to wider	**Headward erosion:** Erosion towards the source causes channel to become longer

		• **Hydraulic action**: Force of water pounding on riverbanks and riverbed • **Abrasion**: Eroded material scrapes against riverbanks and riverbed • **Pothole scouring**: Large particles swirl in hollows in riverbed • **Attrition**: Small particles bump against one another, becoming rounder • **Corrosion**: Acids in water cause the channel rocks to dissolve • **Solution**: Some rocks dissolves in water without any chemical breakdown • **Undermining**: Riverbanks are undercut by the force of the water

ACTIVITY 2.1 DRAINAGE SYSTEMS

2.1 Study FIGURE 1.5, which is based on drainage basins.



[Source: Examiner's own sketch]

2.1.1 Define the term drainage basin. (1 x 1) (1)

_____

2,1.2 Does drainage basin **A** (north of the watershed) or drainage basin **B** (south of the watershed) have the higher drainage density? (1 x 1) (1)

_____

2.1.3 State ONE factor that could have contributed to the high drainage density of the drainage basin identified in QUESTION 1.5.2. (1 x 2) (2)

_____

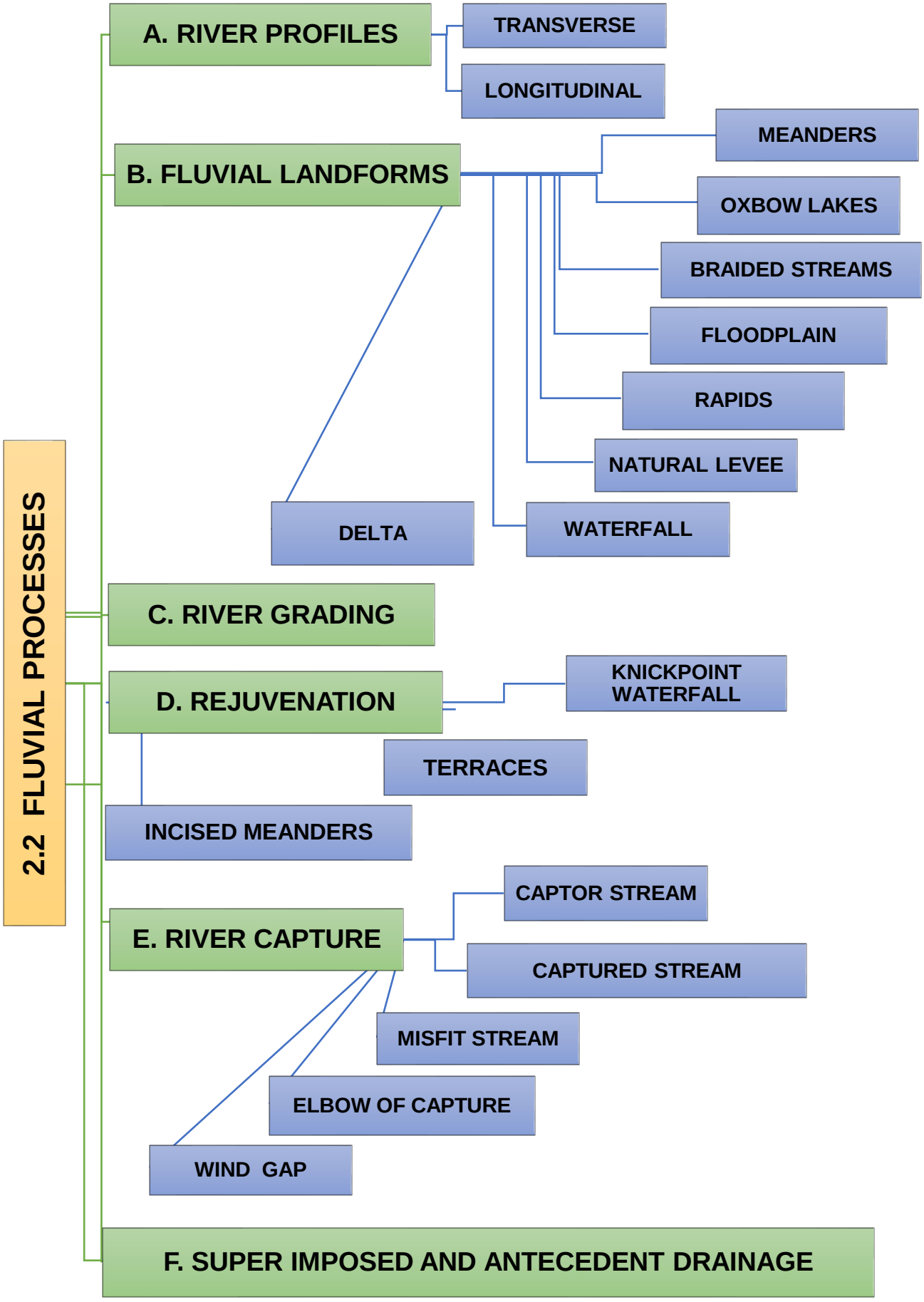
2.1.4 Determine the stream order at **D** in drainage basin **B.** (1 x 2) (2)

2.1.5 Refer to drainage basin **A** and state the relationship between stream order and the:

(a) Length of streams (1 x 2) (2)

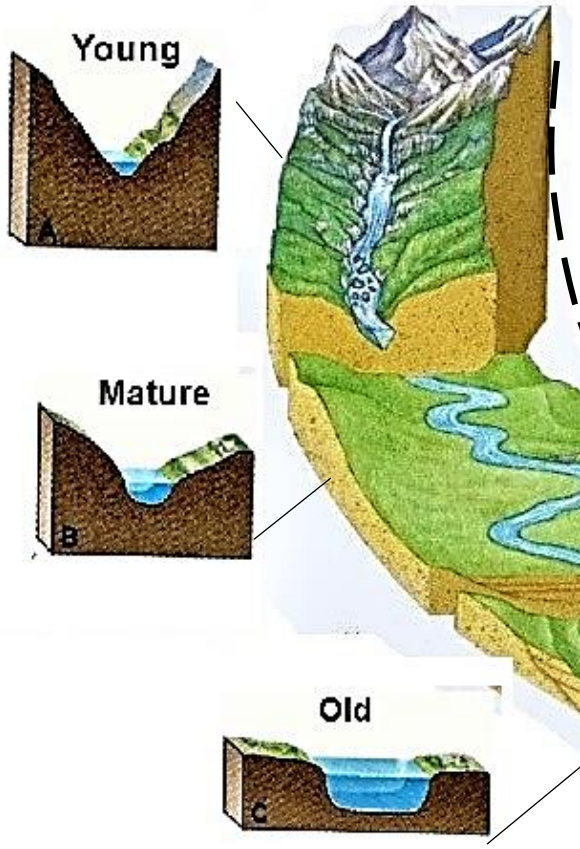
(b) Number of streams (1 x 2) (2)

2.1.6 Evaluate the effect of a prolonged period of drought on the stream order at point **C** in drainage basin **A**. (2 x 2) (4)


2.2 FLUVIAL PROCESSES
A. RIVER PROFILES
TRANSVERSE
LONGITUDINAL
B. FLUVIAL LANDFORMS
MEANDERS
OXBOW LAKES
BRAIDED STREAMS
FLOODPLAIN
RAPIDS
NATURAL LEVEE
WATERFALL
DELTA
C. RIVER GRADING
D. REJUVENATION
KNICKPOINT
WATERFALL
TERRACES
INCISED MEANDERS
E. RIVER CAPTURE
CAPTOR STREAM
CAPTURED STREAM
MISFIT STREAM
ELBOW OF CAPTURE
WIND GAP
F. SUPER IMPOSED AND ANTECEDENT DRAINAGE

A. FLUVIAL PROFILES

TRANSVERSE PROFILE:
Shape of the river valley from one bank to the other



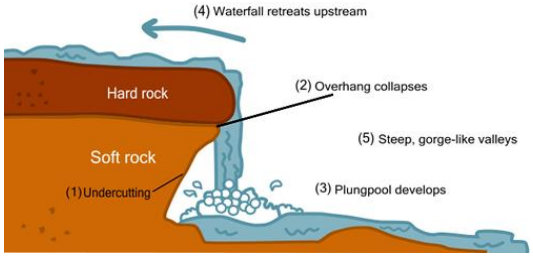
Upper Stage	Middle Stage	Lower Stage	CHARACTERISTICS
Active vertical mostly	Active vertical and horizontal erosion	Some horizontal but not much erosion	**Erosion**
Steep, steep valley sides	Becoming flat	Flat	**Gradient**
Some boulders too heavy to be transported in small stream	Deposition inside meander bends	Lots of deposition especially near mouth where river slows	**Deposition**
Deep	Deep in places	Shallow (because of deposition)	**Depth**
Fast	Medium	Slow	**Velocity**
Narrow	Wide in parts	Very wide	**Width**
Very low	Medium	Large	**Volume**
Waterfalls, V-shaped valley, gorges, interlocking spurs	Small meanders, oxbow lakes, small floodplains	Floodplains, mouth, delta, estuary, large meanders, oxbows	**Landforms**

LONGITUDINAL PROFILE:
The gradient of a river from the source to the mouth

B. FLUVIAL LANDVORMS

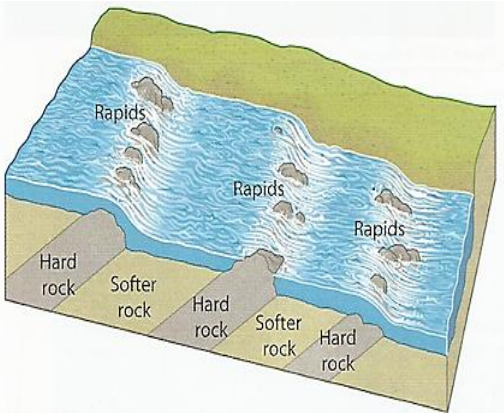
<table>
<tr><th colspan="2">Landforms of erosion</th><th>Landforms of deposition</th></tr>
<tr>
<td><h2>WATERFALLS:</h2>

Sudden fall of water when it flows over a resistant layer, cliff, softer layers are eroded away.
Upper course

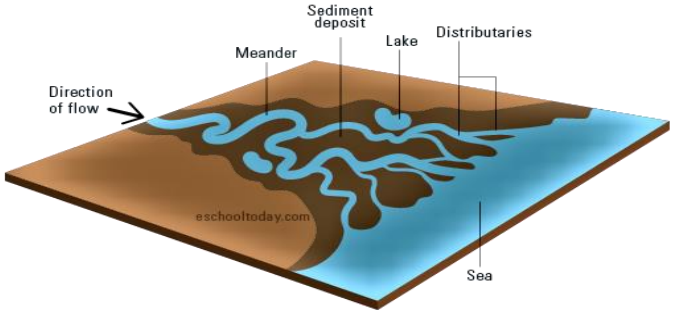


Plunge pool: Force of falling water erodes a hole at bottom of cliff
Waterfall retreat: When softer rock underneath hard rocks erodes away and results in an overhang that collapses
</td>
<td><h2>RAPIDS:</h2>

When the river crosses uneven ground, creating small step-like waterfalls
Upper course

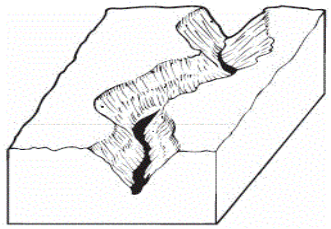

</td>
<td><h2>DELTAS:</h2>
Deposition near the mouth of a river

Rivers' flow slows down because of gentle gradient
Deposit sediments faster than the sea removes it
Sediments build up to form a delta and block river mouth
Results in braided streams to develop
Fertile soil that is used for agriculture
Lower level


</td>
</tr>
</table>

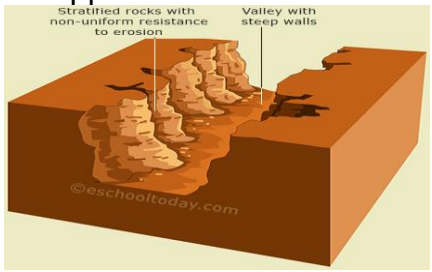
GORGE:

- Very deep, steep-sided valley formed by an energetic river in humid environment
- Upper course



CANYON:

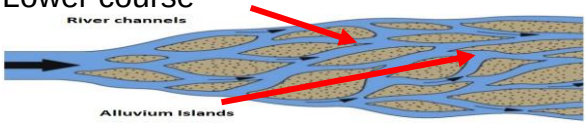
- Very deep steep-sided valley formed by an exotic river in an arid environment
- Upper course



BRAIDED STREAMS:

Many small, shallow channels that often divide and recombine

- When river gradient becomes gentle, river loses energy and depositing its load
- Path of river becomes blocked and river subdivide and flow around the alluvium
- Lower course



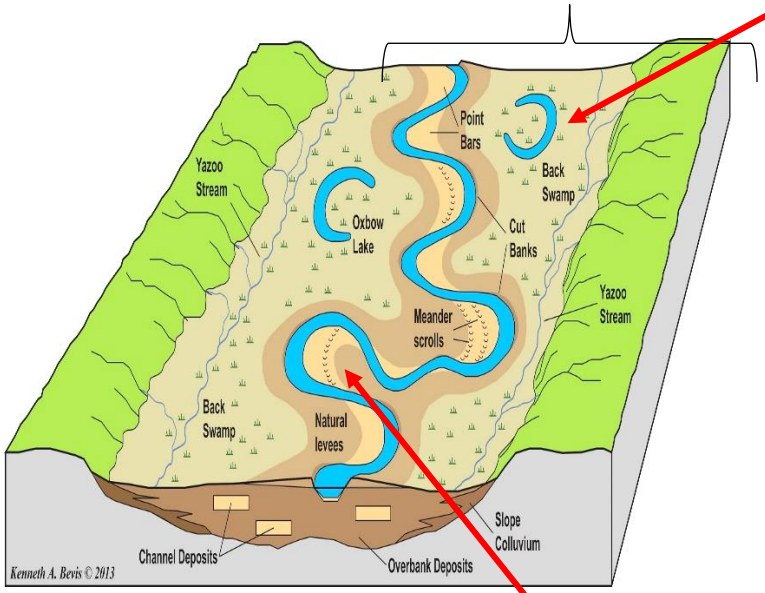
FLOOD PLAIN:

A flat plain surrounding a river channel with alluvium covering the surface

- Fertile ground because of deposition during flooding
- During flooding, reduction in velocity due to friction with floodplain
- Layer of silt added after each flood
- Bluff line: Edge of floodplain
- Lower coarse
- Widened by lateral erosion

Landforms of a floodplain:

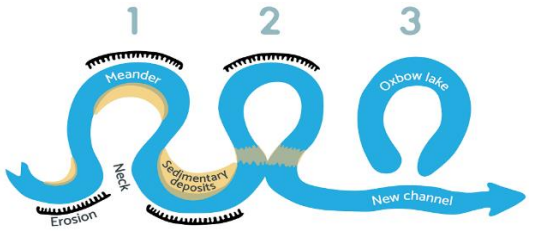
1. Natural levee
2. Meander
3. Ox-bow lake
4. Braided streams
5. Deltas

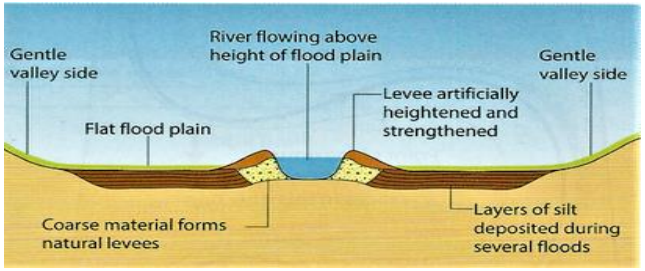
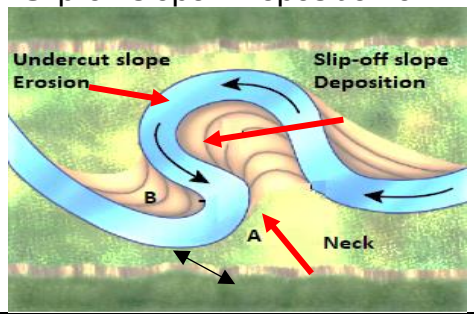
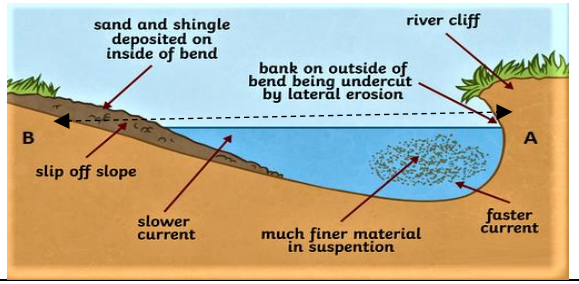


OXBOW LAKES:

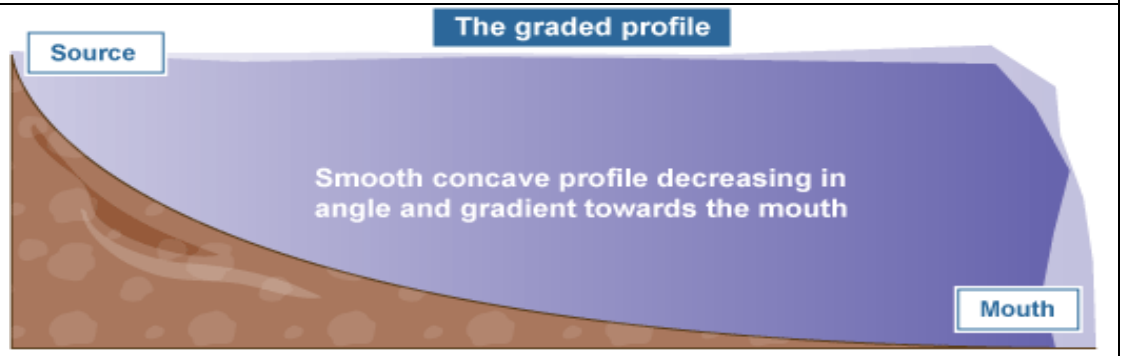
A body of water that is cut-off when a river takes a new course across the neck of a meander loop

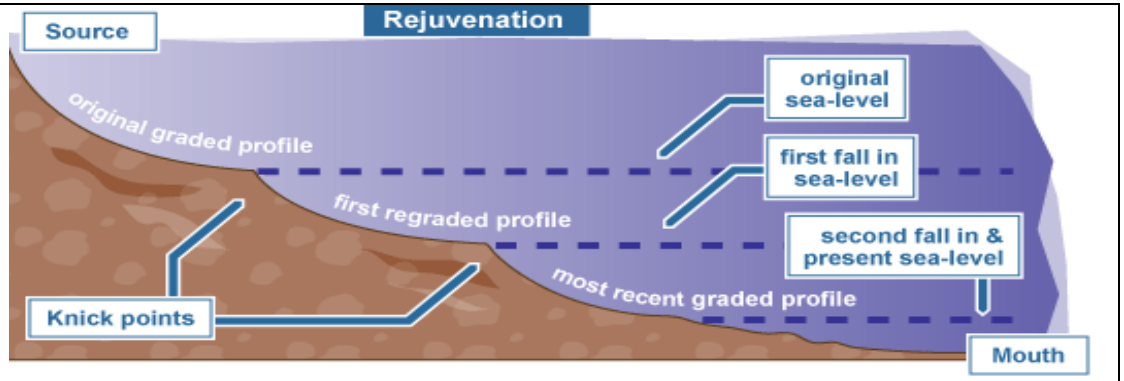
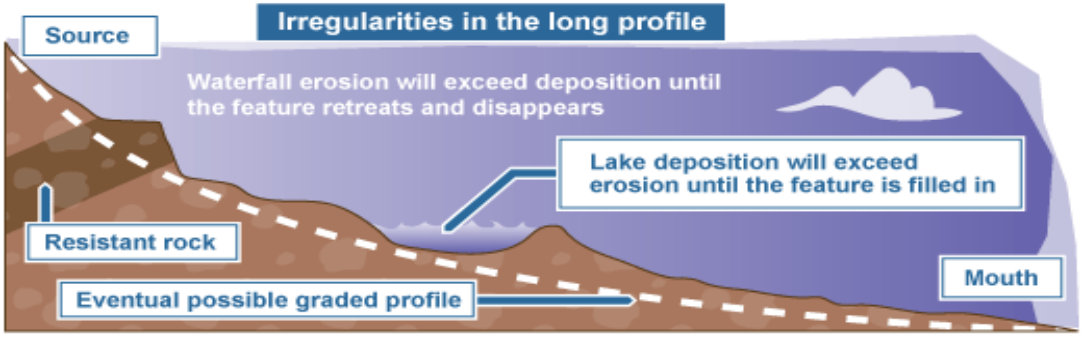
- Erosion on outer bank narrows meander neck
- River cuts through neck during a flood
- Deposition on outer bank continue and blocks off the old meander loop



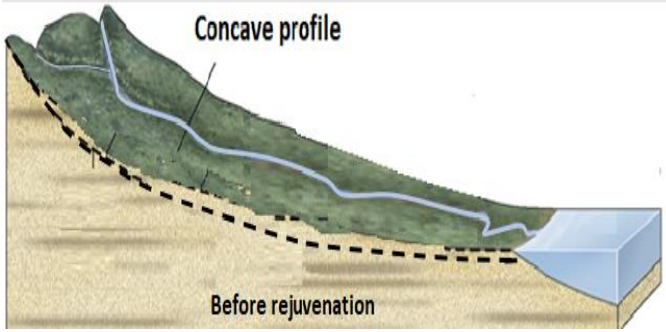
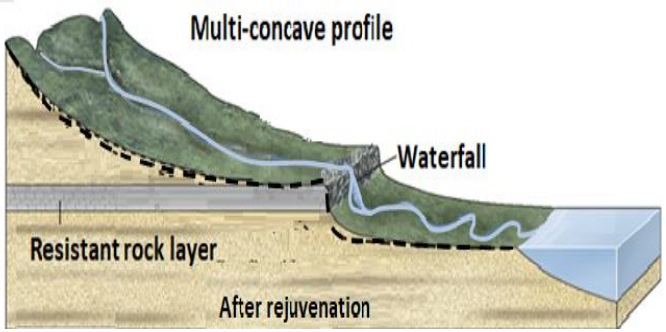
NATURAL LEVEES:	MEANDERS:
Raised riverbank on the side of a river • Coarsest material deposited first during flooding • Provide natural protection against floods • Can also result in less water reaching the flood plain because of raised banks • Lower coarse 	The winding pattern of s-shaped bends in a river because of lateral erosion • Middle course • Migrate laterally across the floodplain by eroding the curved outside • Undercuts slope - Erosion on outer bend as river flows faster with more energy • Slip-off slope - Deposition on inner bank as river flows slower with less energy  

C. RIVER GRADING

GRADING OF RIVER	LONGITUDINAL PROFILE
Graded profile: When the gradient is just enough for the transportation of the load under existing volume and channel shape. **Characteristics:** • Concave profile • Decreasing angle towards the mouth	

Under graded profile: If the load is greater than the stream capacity, and the river deposits material **Characteristics:** • Knick points • Multi-concave profile • Many temporary bases	
Over graded profile: When the load is less than the capacity and the stream can collect more through erosion. It will decrease the gradient and result in a graded profile **Characteristics:** • Erosion exceed deposition in upper course • Deposition exceeds erosion in temporary bases (dam/lake)	

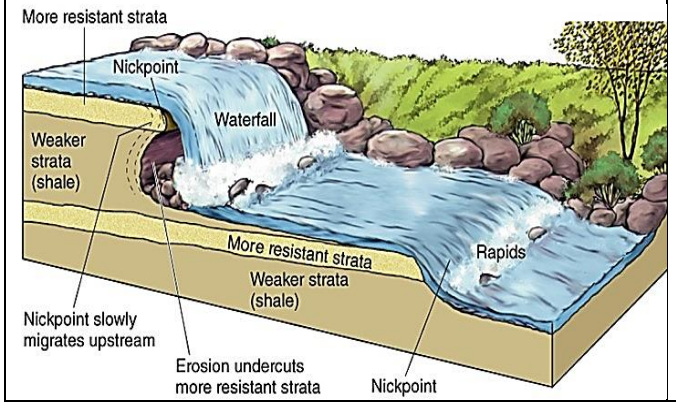
D. REJUVENATION

When a river gains renewed energy and erodes downwards again **Reasons for rejuvenation:** • Increase of gradient because of drop in sea level • Uplift/raising of landform • Increase in volume because of increase in rainfall • Increase in runoff • River capture	**Longitudinal profile**	**Before**	**After**
			

Landform features as evidence of Rejuvenation

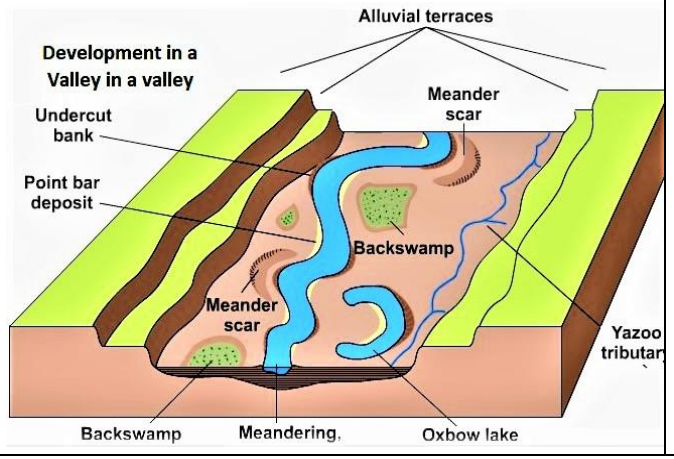
Knickpoint waterfalls:

- Break in slope of river profile
- Knickpoint marks the old base level
- Gradient upstream is gentle and downstream steeper
- Over time knickpoint moves higher up because of headward erosion



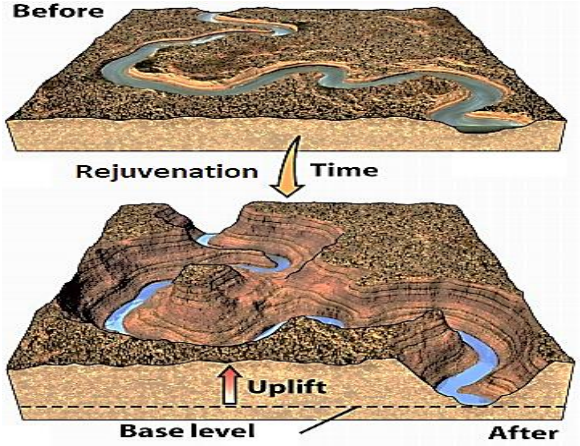
Valleys within valleys:

- River maintains its meandering
- Renewed energy cause increased vertical erosion
- New valley carved into its own floodplain
- Result in terraces on both sides of river



Incised meanders:

- River maintains its meandering
- Renewed energy cause increased vertical erosion
- Decrease in lateral erosion of already existing meanders



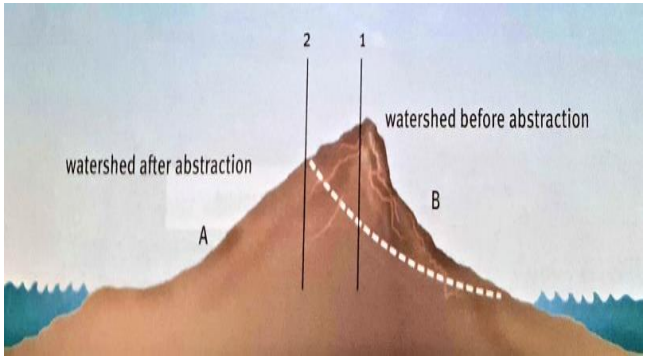
E. RIVER CAPTURE

Abstraction:

Lowering and shifting of the watershed

Reasons:

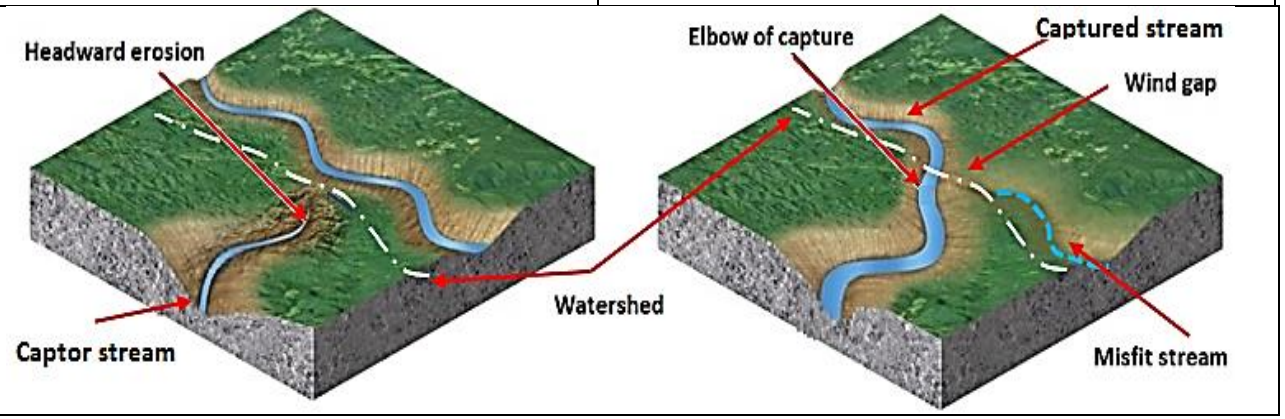
- When the stream on one side of the watershed is a more energetic river (B)
- Steeper gradient (B) – more rapid erosion
- Vertical and headward erosion lower watershed

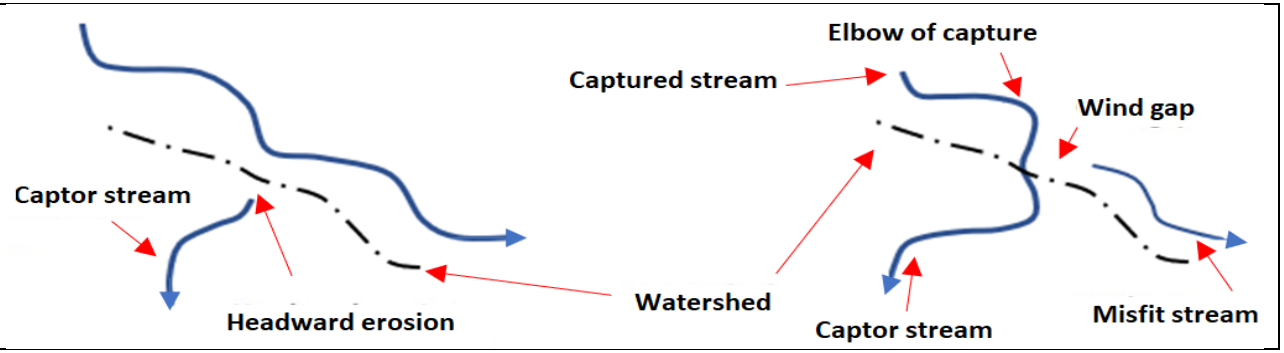


Features of river capture

- **River Capture**: When a river which has gained more energy, captures or intercepts the head waters of another river
- **Captor stream:** More energetic stream which eroded through the watershed and capture another river
- **Captured stream:** The upper course of a river which has been intercepted by a captor stream
- **Misfit stream:** Stream that is too small for the area it drains as the headwaters have been captured
- **Elbow of capture:** Point where capture occurred and changes in the direction of captive stream takes place
- **Wind gap:** Dry part of the original valley between the elbow of capture and misfit stream

Oblique view



	Plan view	Captor stream Headward erosion Watershed Elbow of capture Captured stream Wind gap Captor stream Misfit stream

F. SUPERIMPOSED AND ANTECEDENT DRAINAGE PATTERNS

SUPERIMPOSED STREAM:

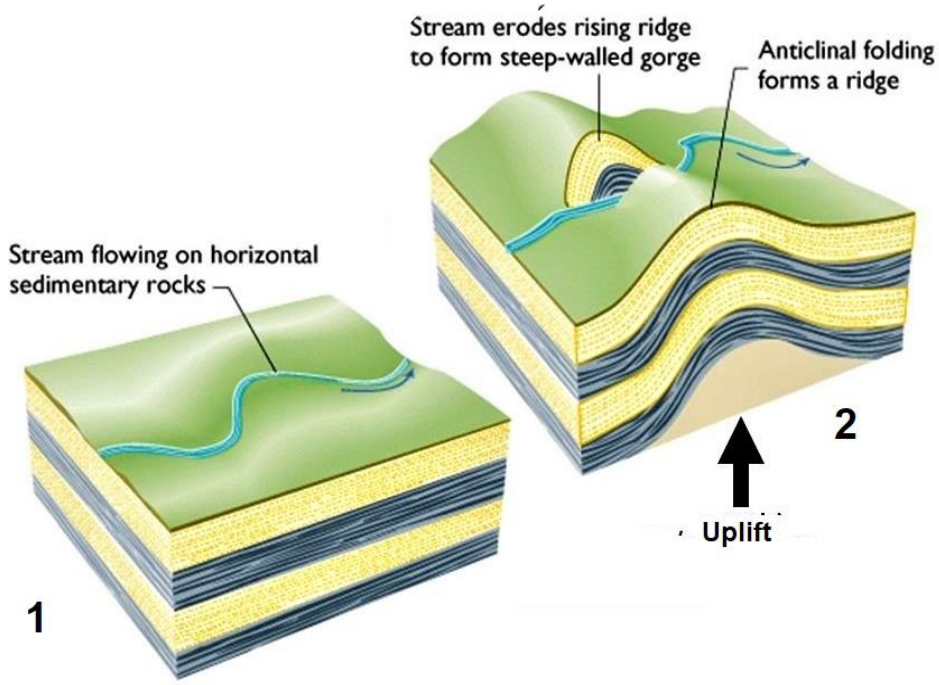
When a river flowing over a softer rock layer reaches the harder rocks but continues to follow in the initial slope, it seems to have no relation with the harder rock bed.

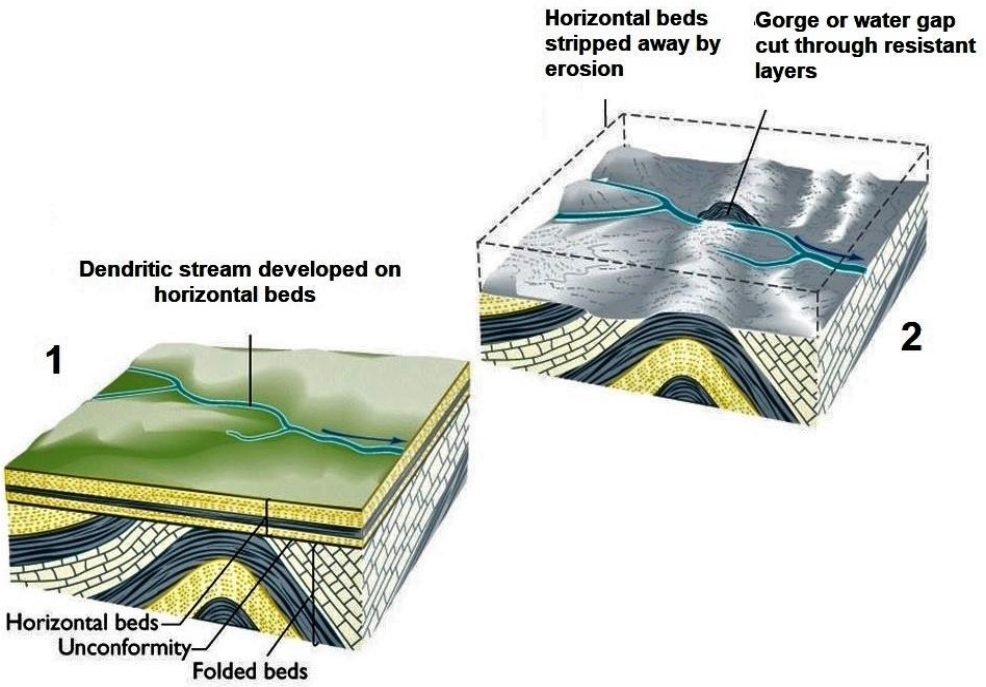
- Landscape existed before stream developed
- Stream inherited its course from a former overlying layer
- Downcutting cause a gorge to form
- Rivers course does not match the topography of the surrounding landscape
- River superimposes its drainage pattern on the older rocks below
- River is younger than the structure over which it flows

AN ANTECEDENT STREAM:

A stream that maintains its original course and pattern despite the changes in underlying rock topography.

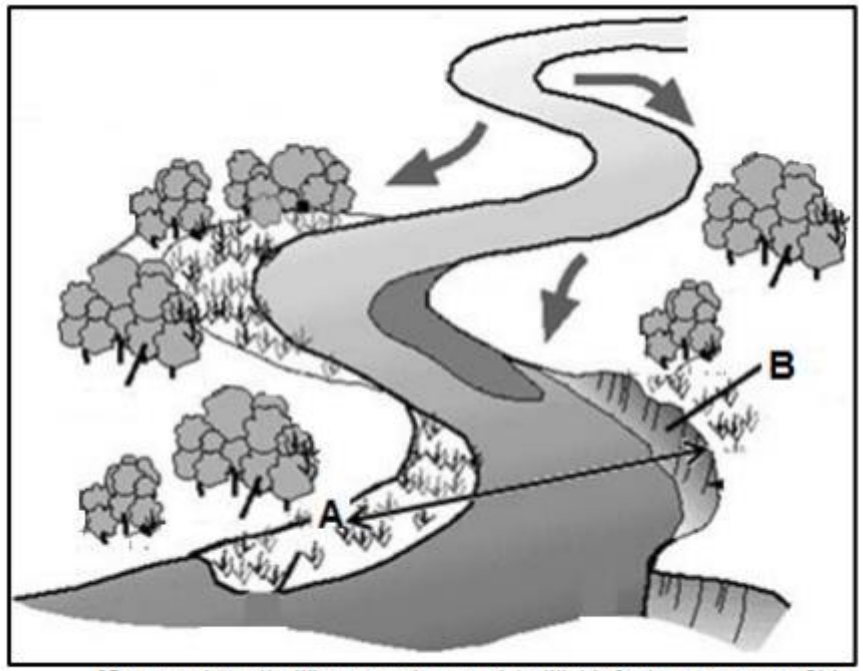
- Uplift/compressive formation
- River develops its course before an uplift event took place
- River maintains its original course, cutting through the mountains to form a gorge
- The river is older than the landscape




Horizontal beds stripped away by erosion
Gorge or water gap cut through resistant layers
Dendritic stream developed on horizontal beds
1
2
Horizontal beds
Unconformity
Folded beds

ACTIVITY 2.2 FLUVIAL PROCESSES

2.2 Refer to FIGURE 2.2 showing a stream channel.



[Source: http://adlib.everysite.co.uk/adlib/defra/content.aspx?id=000IL3890W.17UT30ZOH8G447]

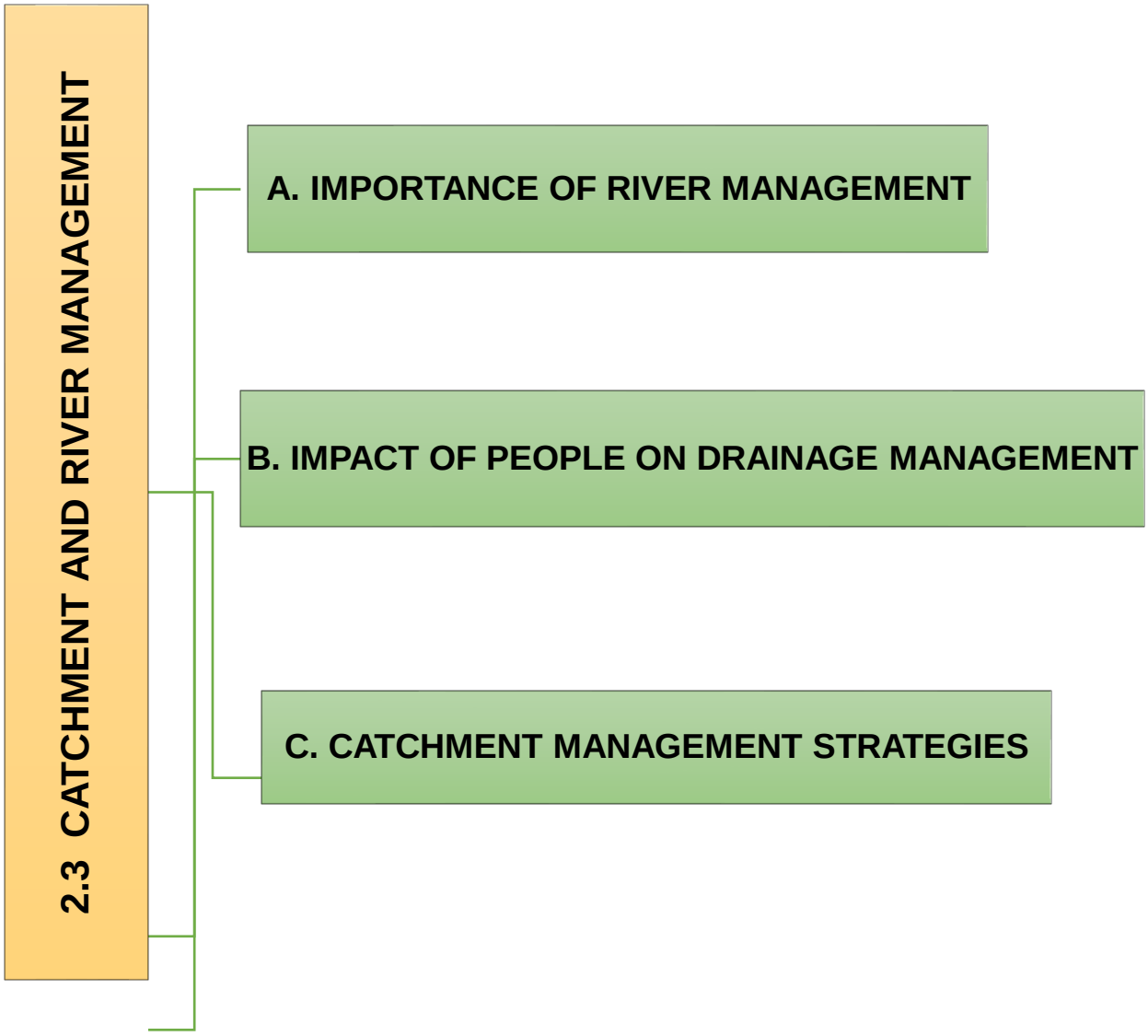
2.2.1 Identify the stream channel pattern shown in FIGURE 2.2. (1 x 1) (1)

2.2.2 In which course of the river is the illustrated stream channel pattern most likely to be found? (1 x 1) (1)

2.2.3 Give ONE reason why the illustrated stream channel pattern will develop during the river named in QUESTION 2.2.2. (1 x 2) (2)

2.2.4 Draw a simple, labelled cross-section of the meander between points A and B. (2 x 2) (4)

2.2.5 You would like to develop a campsite along the banks of the illustrated river. After careful consideration, you choose a site along slope/bank **A** rather than along slope/bank **B.** In a paragraph of approximately EIGHT lines, explain why the site along slope/bank **A** the better choice is. (4 x 2) (8)


2.3 CATCHMENT AND RIVER MANAGEMENT
A. IMPORTANCE OF RIVER MANAGEMENT
B. IMPACT OF PEOPLE ON DRAINAGE MANAGEMENT
C. CATCHMENT MANAGEMENT STRATEGIES

2.3 RIVER CATCHMENT AND MANAGEMENT

	WATER QUALITY	WATER QUANTITY	FLOW PATTERNS OF RIVER
A. IMPORTANCE	• Clean sustainable resource • To control pollution	• Managed for irrigation purposes • Building of dams in river course to regulate water flow • To ensure permanent source of water • Make water use sustainable • Alien vegetation use more water than natural vegetation	• To provide flood control • To protect water resources • To be used for recreation, water sport, caravan parks and holiday resorts
B. HUMAN IMPACT	• Landfills, mining, and agriculture pollute groundwater • Industrial works discharge waste into rivers • Agricultural run-off contains fertilizers and pesticides into rivers • Domestic use of rivers in informal settlements • Ecology of rivers and catchment areas disrupted • Oil washed into storm water drains and then into rivers • Litter e.g. plastic caught along riverbank • Siltation: accumulation of silt and clay in river water – erosion	• Boreholes reduce the amount of groundwater that feeds rivers • Alien vegetation consumes large quantities of water • Overgrazing and removal of vegetation reduce groundwater infiltration • Dams abstract water from river system • Building on floodplain decrease infiltration • Reduced water security: availability of clean water – increase in cost of water	• Draining of wetlands causes increased flooding • Flood control methods restricts river flow • Natural run-off changes by building of dams • Removal of natural vegetation for urban development increase runoff • Draining of swamps for development • Manipulation of meanders by building of channels • Building of manmade levees to keep water in the channel • Inter-basin transfer of water
C. STRATEGIES	• Managing groundwater supplies • Removal of alien vegetation • Introduce afforestation/re-vegetation programmes to prevent erosion • Conserving wetlands as natural sponges that filter out toxins • Wetlands: control flooding and filter sand / silt • Preserves natural vegetation to slow down runoff and promote filtration • More infiltration contributes to increase of groundwater	• Encourage better farming practices with better use of fertilizers • Upgrade and maintain sewage systems • Public awareness campaigns • Recycling of water – use of grey water	

ACTIVITY 2.3 CATCHMENT AND RIVER MANAGEMENT

2.3 Read the extract in FIGURE 2.6 based on river catchment areas in South Africa.

CASE STUDY ON RIVER MANAGEMENT: SOUTH AFRICAN CATCHMENTS AREAS

Covering many South African river basins, the 'Working for Catchments' programme operates in all major catchment areas.
65% of South Africa receives less than 500 mm average annual rainfall, meaning that drought is an ever-present risk in South Africa.
Future projections indicate that by 2025 the country's water requirements will outstrip water supply unless urgent steps are taken to manage the resource more sustainably. There are already major problems of water supply and water quality, with an estimated 8 million South Africans currently having no access to potable water.

[Adapted from http://wwf.panda.org/about_our_earth/about_freshwater

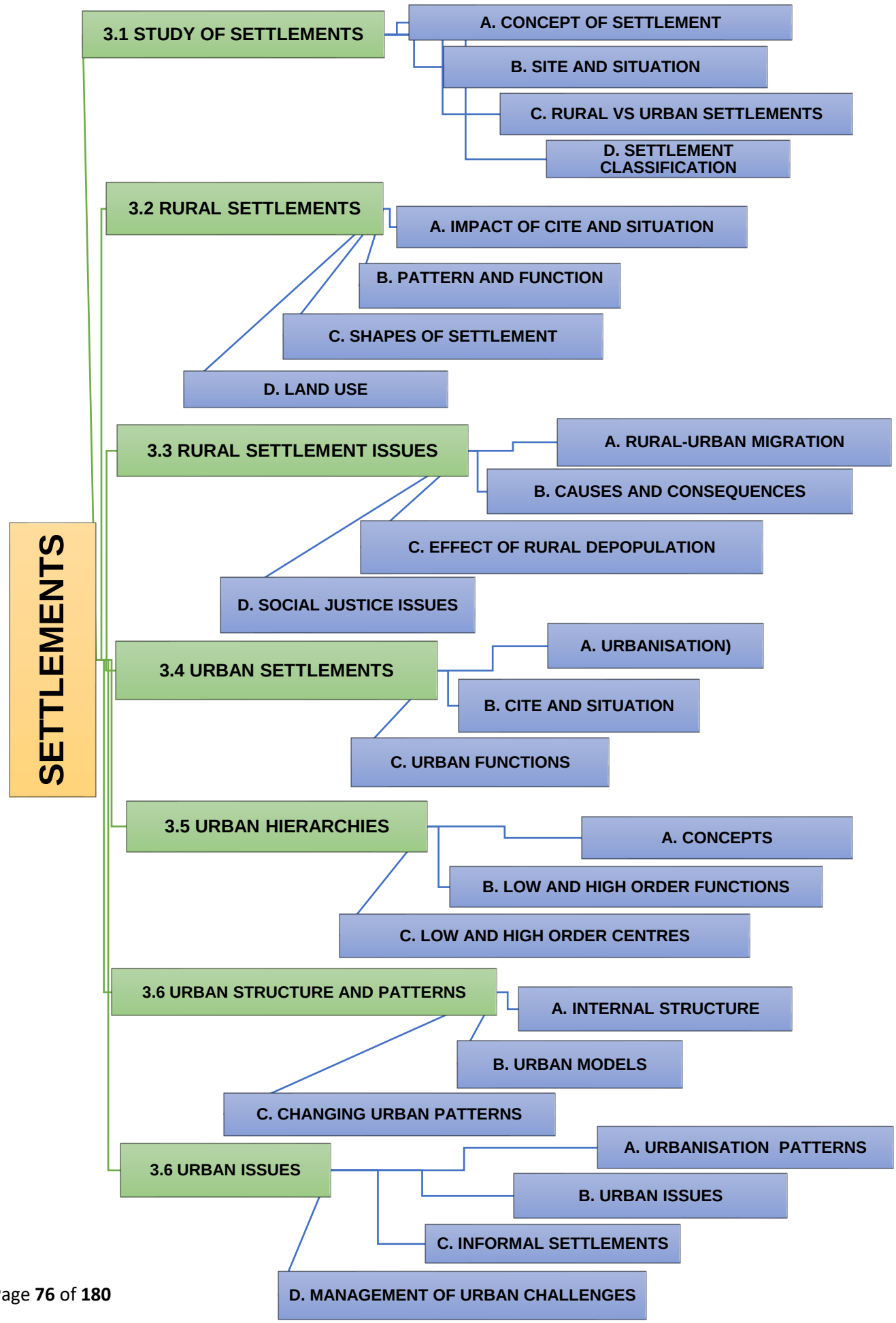
2.3.1 What is a catchment area? (1 x 1) (1)

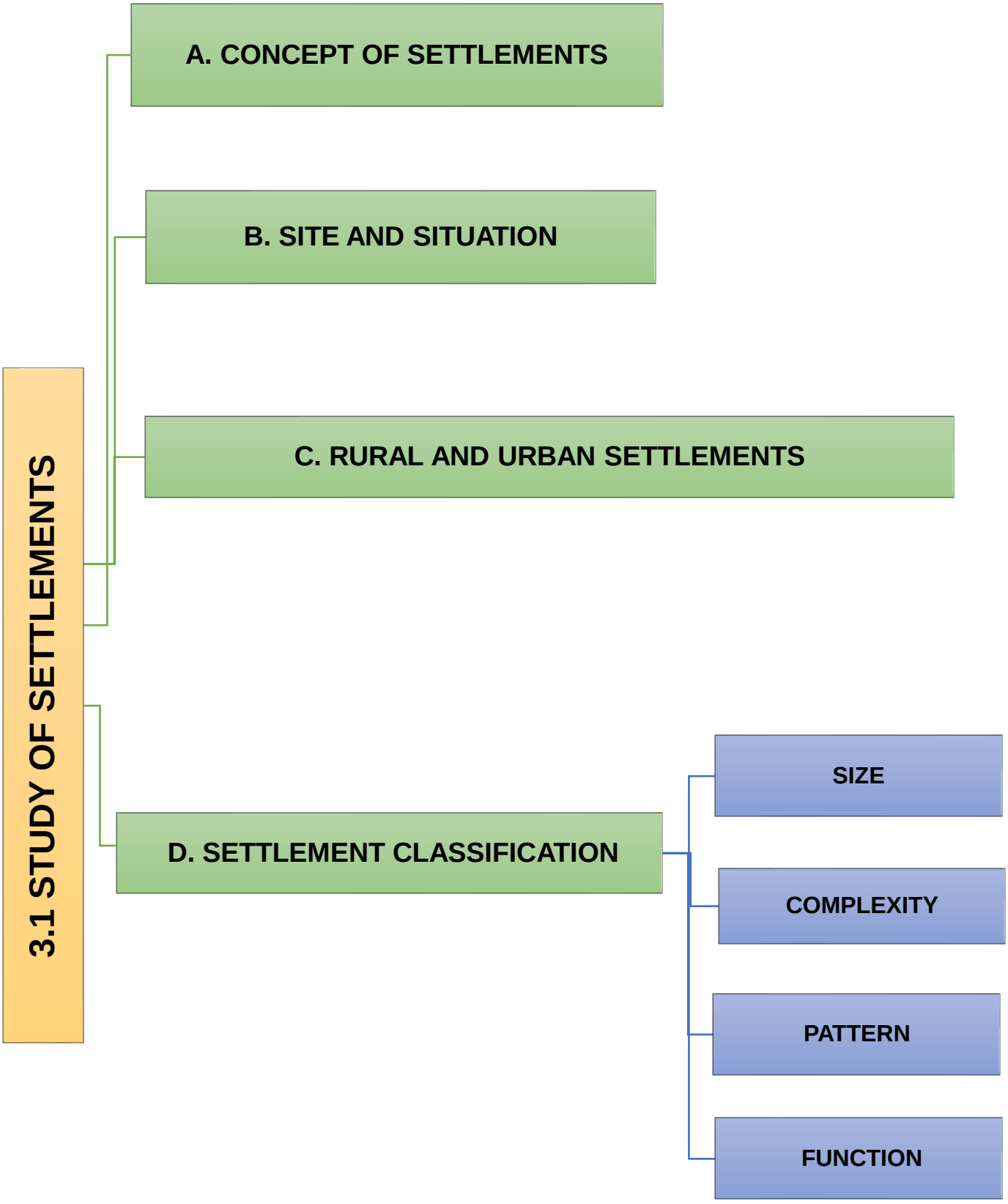
2.3.2 What evidence in the article indicates that drought is a never-present risk? (1 x 2) (2)

2.3.3 Give ONE reason for the destruction of catchment areas. (1 x 1) (1)

2.3.4 Suggest TWO steps that need to be taken by the government and non-governmental organisations (NGOs) to manage catchment areas that are at risk. (2 x 2) (4)

2.3.5 In a paragraph on approximately EIGHT lines, discuss the negative impact of poor catchment management practices for South Africa. (4 x 2) (8)


SETTLEMENTS
3.1 STUDY OF SETTLEMENTS
A. CONCEPT OF SETTLEMENT
B. SITE AND SITUATION
C. RURAL VS URBAN SETTLEMENTS
D. SETTLEMENT CLASSIFICATION
3.2 RURAL SETTLEMENTS
A. IMPACT OF CITE AND SITUATION
B. PATTERN AND FUNCTION
C. SHAPES OF SETTLEMENT
D. LAND USE
3.3 RURAL SETTLEMENT ISSUES
A. RURAL-URBAN MIGRATION
B. CAUSES AND CONSEQUENCES
C. EFFECT OF RURAL DEPOPULATION
D. SOCIAL JUSTICE ISSUES
3.4 URBAN SETTLEMENTS
A. URBANISATION)
B. CITE AND SITUATION
C. URBAN FUNCTIONS
3.5 URBAN HIERARCHIES
A. CONCEPTS
B. LOW AND HIGH ORDER FUNCTIONS
C. LOW AND HIGH ORDER CENTRES
3.6 URBAN STRUCTURE AND PATTERNS
A. INTERNAL STRUCTURE
B. URBAN MODELS
C. CHANGING URBAN PATTERNS
3.6 URBAN ISSUES
A. URBANISATION PATTERNS
B. URBAN ISSUES
C. INFORMAL SETTLEMENTS
D. MANAGEMENT OF URBAN CHALLENGES


3.1 STUDY OF SETTLEMENTS
A. CONCEPT OF SETTLEMENTS
B. SITE AND SITUATION
C. RURAL AND URBAN SETTLEMENTS
D. SETTLEMENT CLASSIFICATION
SIZE
COMPLEXITY
PATTERN
FUNCTION

3.1 THE STUDY OF SETTLEMENTS

A. THE CONCEPT OF SETTLEMENT:

A settlement is a place where a group of people live together and function together as a group. Settlements can be classified as urban or rural per their size and the kinds of activities that take place there. Rural settlements are usually quite small; most people living there are involved in primary activities such as farming, fishing, forestry, or mining. Rural settlements are, therefore, unfunctional (one function) and have primary activities.

What is a settlement? It is a place where people live which includes buildings, economic activities, and transport networks.

B. SITE AND SITUATION OF SETTLEMENTS

Site and Situation: *It is important to know the difference between SITE and SITUATION of a settlement.*

SITE: The actual (exact) piece of land (physical) established on (where the settlement is built) and the physical characteristics of the piece of land.

Factors influencing the choice of site:
Availability of water, Arable land, grazing land, Building materials level ground

SITUATION: The position of the settlement in relation to the surrounding environment.

Factors influencing the choice of situation:
Transport routes, The general relief (e.g. valley, mountain etc.), Aspect, Soil fertility
When the site, situation, are combined, we find that some areas tend to be nucleated while other areas are dispersed.



C. RURAL AND URBAN SETTLEMENTS





RURAL SETTLEMENT: is a settlement where only primary activities/ functions are practised e.g. fishing, mining, forestry, and farming.

URBAN SETTLEMENT: is a settlement where secondary and tertiary activities are practised, and people are involved in manufacturing of goods or services

FUNCTION: is the main economic activity / purpose of a settlement e.g. port, trade, settlements can be unfunctional (one dominant function) or multi-functional (more than one function)

SITE: the actual land on which a settlement is built/ the exact piece of land that is occupied by a settlement

SITUATION: the situation of a settlement is its position in relation to its human and physical features such as hills and rivers, land uses such as roads, industries and other settlements

Rural Settlements



The function of a Settlement: *Most rural settlements are serviced by a central service centre. The service centres provide a market and provide goods and services to the surrounding population, for example, transport, medical. Once you have identified the settlement, you must identify the characteristics of that settlement.*

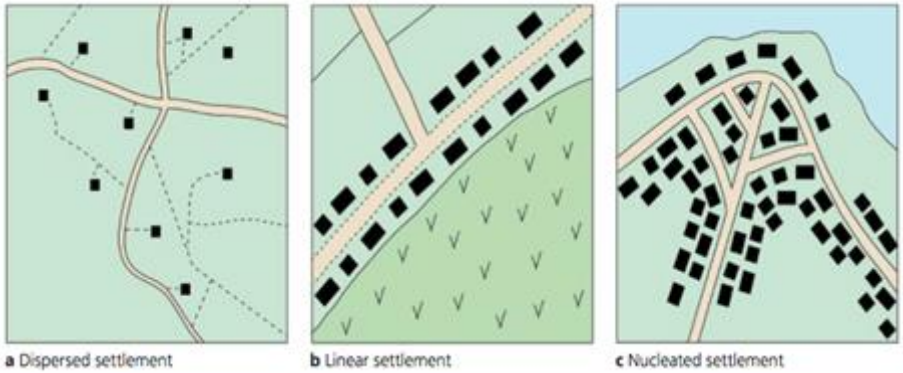
D. SETTLEMENT CLASSIFICATION PER SIZE, COMPLEXITY, PATTERN AND FUNCTION

Characteristics of a settlement size:

- Size: The number of people living together. This can vary from the smallest isolated farmstead to a small hamlet (a few farms) to a village that may consist of a few hundred inhabitants. The size is also referred to as the hierarchy of the settlement. Ensure that you know their characteristics and South African examples. The triangle has a large base (lots of small settlements) and a narrow apex (less of the larger settlements)

Characteristics of a settlement pattern:

- There are three main distribution patterns:
- Dispersed - (spread out) patterns that are found in areas that have a strong agricultural base, since people tend to be spread out on the farms in the regional settlements?
- "Financialisaton" of the global economic system with financial exclusion of the rural poor
- Nucleated - (close together) occur in areas where resources are focused in small areas
- Linear pattern - is a special kind of concentrated pattern where the most important economic reasons for settlement exist in lines



What are the key factors that affect the pattern of Rural Settlement

- Resources in the area
- Transportation methods
- Government policies

Declining world economy with

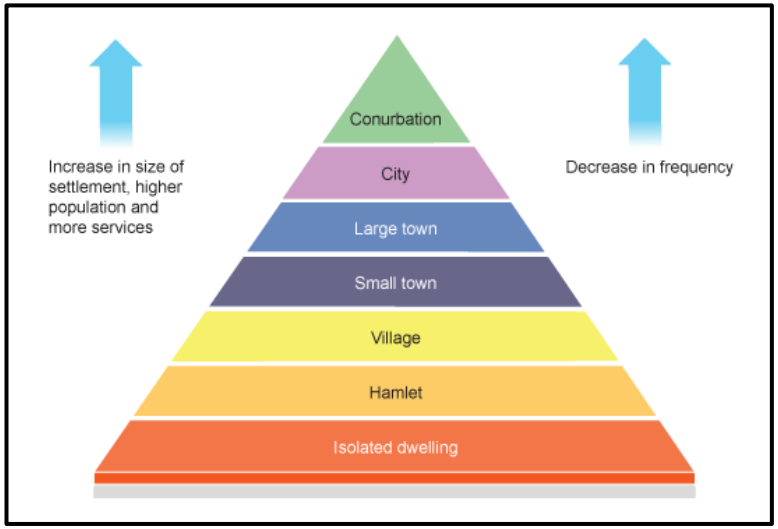
- Massive job losses and contraction of world trade
- Poverty and Hunger
    - Climate change and ecosystem change
    - Threat to rural livelihoods
    - Vulnerability of rural sectors -agriculture, coastal resources, energy, forestry, tourism, and water;
- Regional and Global integration focuses on integrating global markets, neglecting the needs of people that markets cannot meet
- Foreign aid decline with increasing doubt on effectiveness



- Defensive sites- found on higher ground to be able to identify enemies
- Aspect- settlement are often found on the sunny side of a deep valley

	Rural	Urban
Size	Isolated, hamlet, village	Town, City, metropolis, conurbation, megalopolis,
Pattern	Isolated/dispersed	nucleated
Function	UNIFUNCTIONAL (one function), Primary activities e.g. fishing, mining, farming,	MULTIFUNCTIONAL (more than one function), Secondary, Tertiary, Quaternary

SOURCE: http://www.geography.learnontheinternet.co.uk/topics/characteristicsofsettlements.html



Classification Terminology to be used in NSC Examinations:

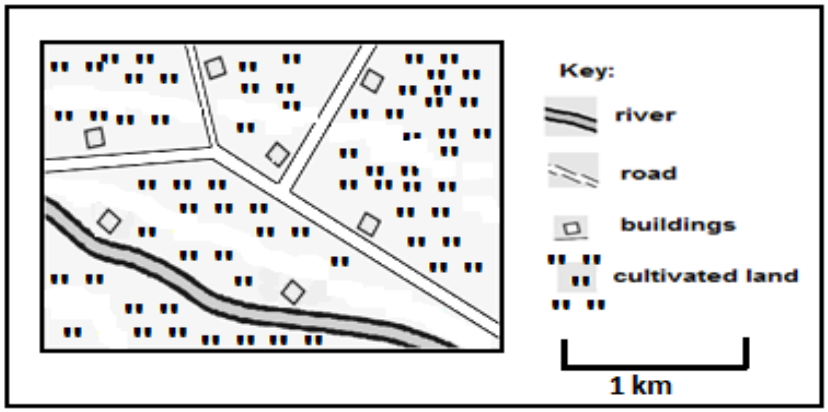
Isolated dwelling is referred to as a Farmstead

Small Town/Large Town is referred to as a Town

An Urban Settlement that is larger than a conurbation is referred to as a Megalopolis

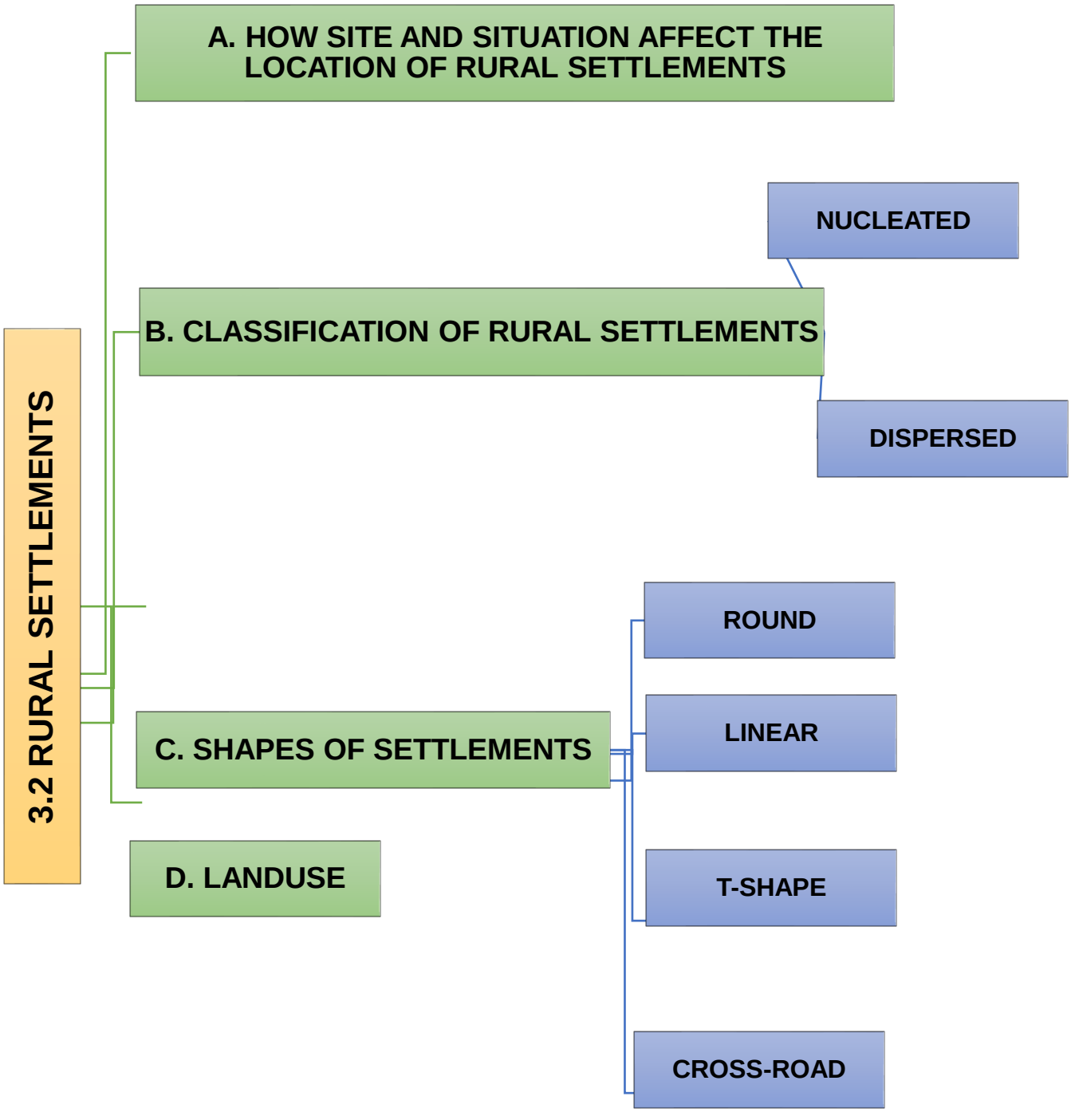
- As you move up the hierarchy the size of the settlement increases
- The number of services that a settlement provides increases with the settlement size
- Small settlements will provide only low order services e. g post office, newsagents and doctors
- Large towns, cities, and conurbations will provide low and high order services e.g. chain stores, hospitals.

ACTIVITY 3.1 A RURAL SETTLEMENT PATTERN



3.1 Refer to FIGURE 3.1 showing a rural settlement pattern.

3.1.1	Identify the rural settlement pattern in FIGURE 3.3.	(1 x 1)	(1)
3.1.2	Give ONE reason for your answer to QUESTION 3.3.1.	(1 x 1)	(1)
3.1.3	Identify the primary economic activity that most people living in this settlement would be involved in.	(1 x 1)	(1)
3.1.4	State TWO possible site factors that influenced people to live in this settlement.	(2 x 2)	(4)
3.1.5	Poor farming practices resulted in lower yields in the illustrated landscape. Write a paragraph of approximately EIGHT lines in which you analyse the impact of poor farming practices on the economy and rural depopulation.	(4 x 2)	(8)


3.2 RURAL SETTLEMENTS
A. HOW SITE AND SITUATION AFFECT THE LOCATION OF RURAL SETTLEMENTS
B. CLASSIFICATION OF RURAL SETTLEMENTS
NUCLEATED
DISPERSED
C. SHAPES OF SETTLEMENTS
ROUND
LINEAR
T-SHAPE
CROSS-ROAD
D. LANDUSE

3.2 RURAL SETTLEMENTS

A. HOW SITE AND SITUATION AFFECT THE LOCATION OF RURAL SETTLEMENTS



Factor that influences location of a settlement

Site of a Rural settlement

Factors that influence the site of rural settlement

- Availability of water
- Arable land
- Pastoral / grazing land
- Building material
- Fuel

Situation of a settlement

Factors influencing situation of settlement:

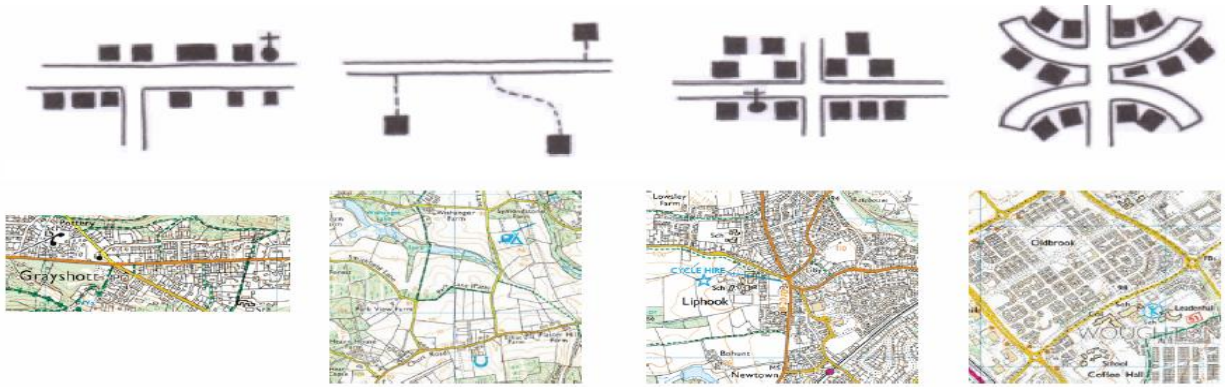
- Aspect
- Flood line
- Access to transport
- Thermal belt

B. CLASSIFICATION OF RURAL SETTLEMENT

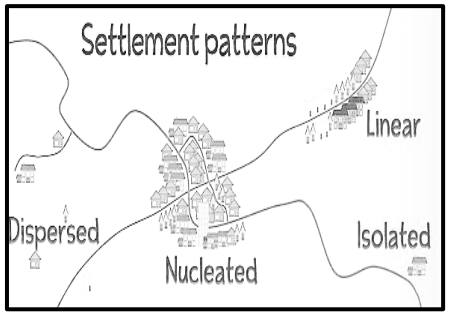
Clustered Rural Settlements: a rural settlement where several families live in close proximity to each other, with fields surrounding the collection of houses and farm buildings.

Dispersed Rural Settlements: a rural settlement which has farmers living on individual farms isolated from neighbours rather than alongside other farmers in settlements

Settlement type	Classification per Pattern	Classification per Functions
Dispersed Pattern	Settlement are arranged far apart from one another e.g. isolated farmstead	They are dominated with one main economic activity e.g. mining, fishing, gathering, hunting, or farming (unfunctional)
Nucleated Pattern	Settlement are arranged close to one another e.g. village	Type of settlement dominated with more than one economic activity. In most situation, they will either be secondary, tertiary or quaternary activities (Multifunctional)

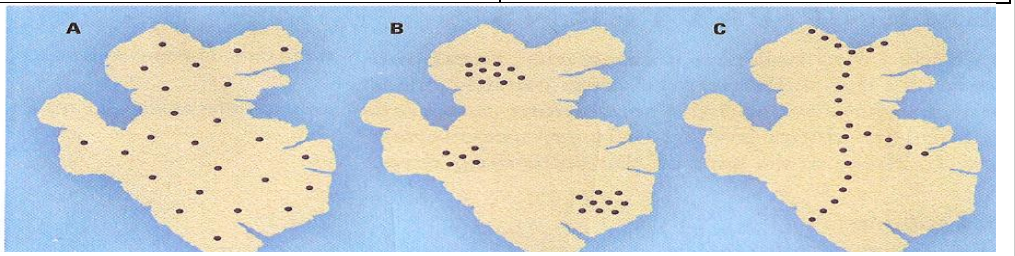


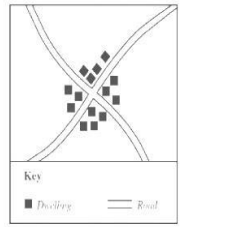
The settlement in which houses are constructed along a road, railway line, river, canal edge of a valley, or along a levee is known as Linear Pattern. Linear rural settlements feature buildings clustered along a road, river, or dike to facilitate communications. The fields extend behind the buildings in long, narrow strips. The town would follow the river so that the river can supply the people with a water source and the availability to travel and communicate. Roads were constructed in parallel to the river for access to inland farms. In this way, a new linear settlement emerged along each road, parallel to the original riverfront settlement.



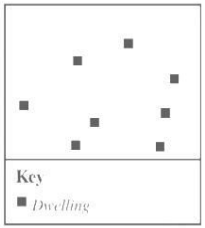
Comparison of nucleated and dispersed settlement

Dispersed settlement	Nucleated settlement
Advantages	Advantages
Farmers can make their own decisions 'They can merchandise and implement environmentally friendly farming method *They are normally large*	*Help is readily available in terms of trouble, danger, or emergency* *Easily socialise* *Farmers need less capital, seeing that they can borrow machines and other implements from each other* *They are normally small due to lack of space*
Disadvantages	Disadvantages
There is a shortage of social contact *Farmers cannot rely on community for any help* *Requires a large amount of capital to maintain the farming practices*	*Farmers must reach consent with regards to certain farming methods* *Land is often fragmented, and thus sometimes too small to mechanise*



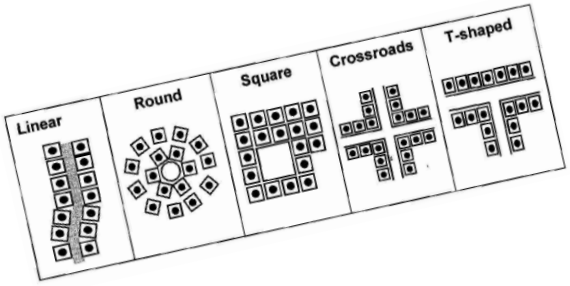


A nucleated settlement pattern refers to the grouping of many houses around a centre called a nucleus.



A dispersed settlement refers to the scattering of houses over a large area.

C. SHAPES ASSOCIATED WITH RURAL SETTLEMENTS

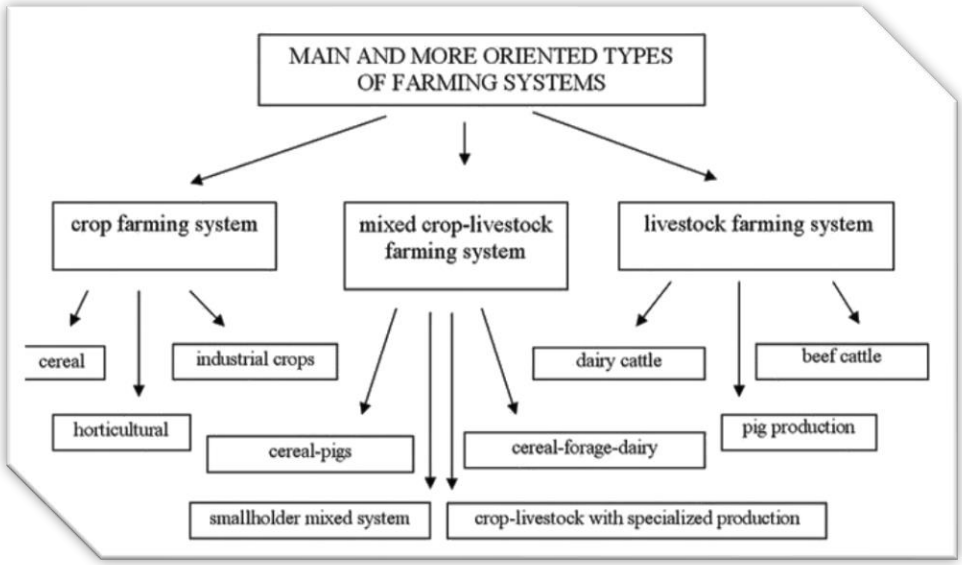




The settlements in which houses are constructed in a rectangular shape are known as Rectangular Shape. Such kind of settlements is found in plain areas or/and in wide inter-montane valley. The settlements in which houses are constructed in a circular shape are known as Round Shape. Such kind of settlements is found around lakes, tanks, or a planned village. The circular form consists of a central open space surrounded by structures. This model has a center with homes, barns, schools, and churches and as you move away from the center, it is surrounded by farmland. Small garden plots were in the first ring surrounding the village, with cultivated land, pastures, and woodlands in successive rings.

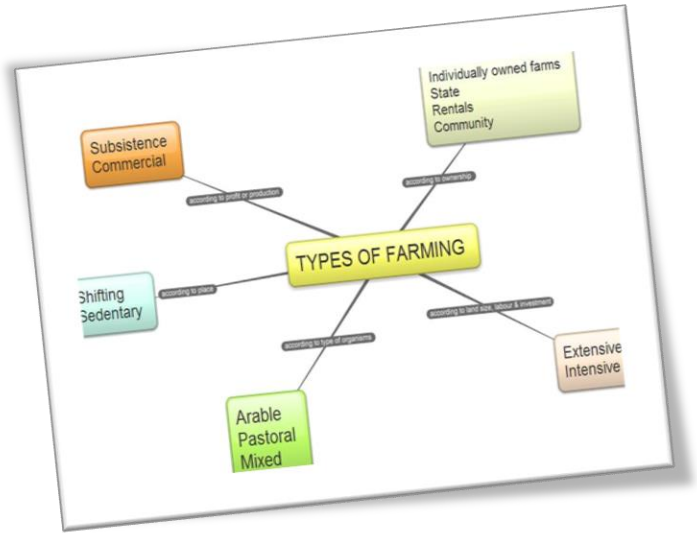
The settlements in which houses are constructed in a star shape are known as Cross Road Shape. Such kind of settlements is found around the points where several roads cross each other (making star shape). The settlements in which houses are constructed at the tri-junctions of the roads are known as T-shaped. Such kind of settlements is found along the road, which meets with another road at the dead end (the straight going road ends) and bifurcates left and right (T-Shape).

The settlement in which houses are constructed along the straight going road, which further bifurcates into two roads (similar to Y shape), is known as Y-Shape pattern.



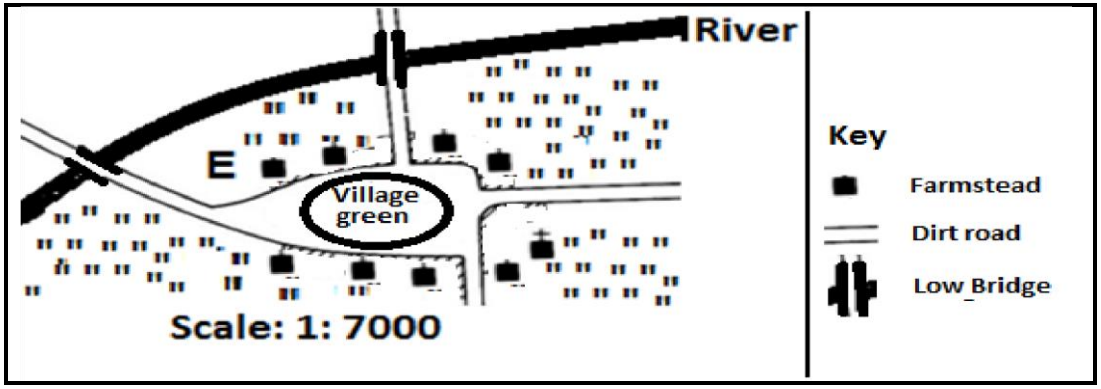
D. LAND USE IN RURAL SETTLEMENT

The largest land use in South Africa is agriculture. Approximately 12, 1% of the land is used for both commercial and subsistence cultivation of crops. Although rural communities focus on primary economic activities (farming and forestry), there are several different ways in which the land in these settlements can be used. Subsistence farming involves using the land to grow crops and breed animals that are a source of food for the family living on the farm. The aim is not to sell the goods, but to consume them. Commercial farming is practised where the land is used to grow crops or breed animals that are then sold as food sources to other markets. The main aim of this rural land use is to generate income for the farmers. Commercial farming can be either intensive or extensive.
Commercial farming can be divided into: Stock farming: Animals, for example, cows, chicken, sheep, pigs. Crop farming: Cultivation of land, for example, maize, wheat, fruit, vegetables. Mixed farming: A combination of stock and



crop farming

ACTIVITY 3.2 A NUCLEATED VILLAGE



[Adapted from *GCSE Handbook*]

.

3.2.1 Describe the shape of the village. (1 x 1) (1)

_____

3.2.2 Discuss TWO disadvantages for farmers living in this village. (2 x 2) (4)

_____

_____

_____

3.2.3 Discuss ONE advantage for farmers living in this village. (1 x 2) (2)

_____

_____

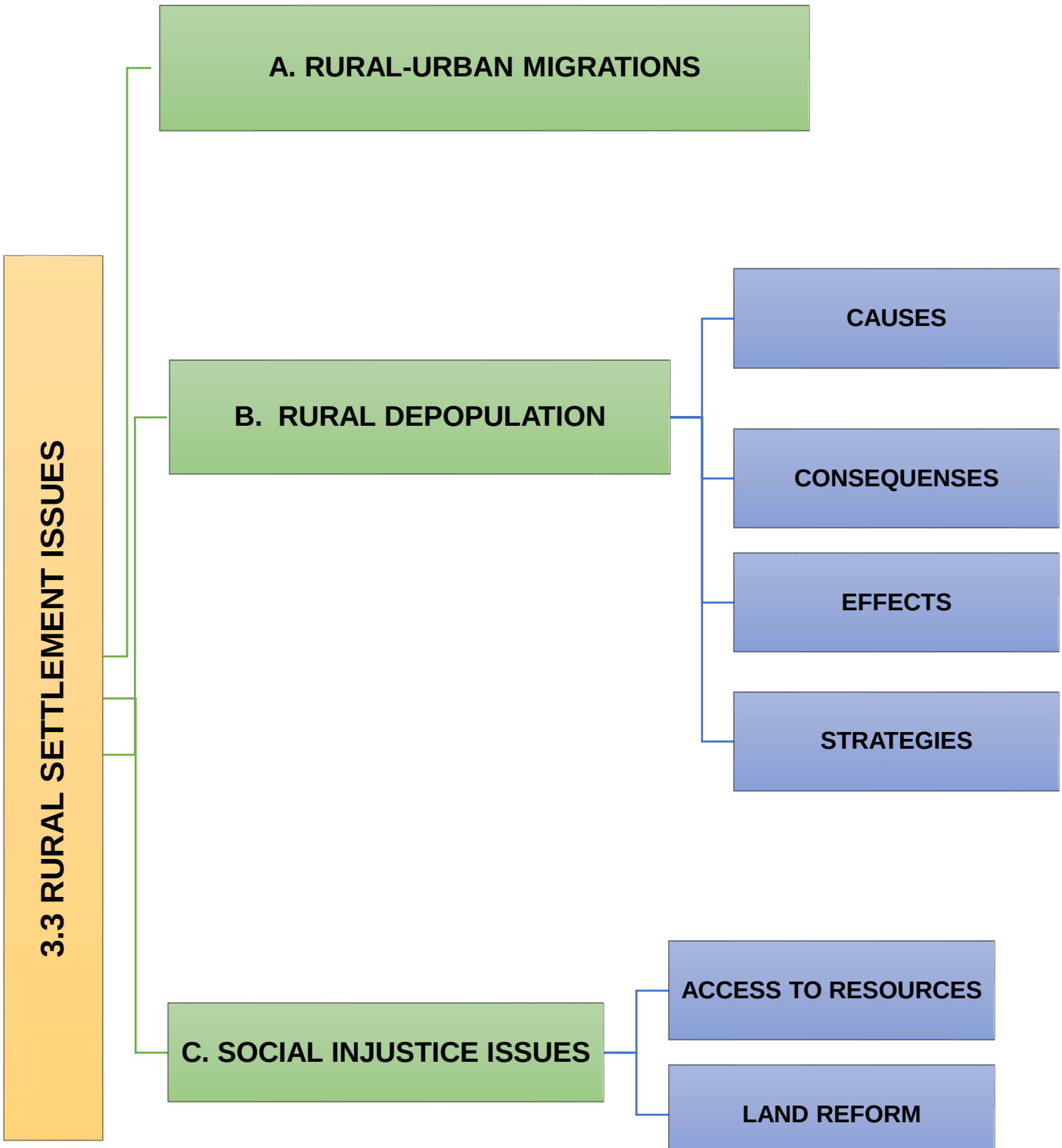
3.2.4 Write a paragraph of approximately EIGHT lines in which you suggest sustainable measures to prevent people from leaving this village to live in cities. (4 x 2) (8)

_____

_____

_____

_____


3.3 RURAL SETTLEMENT ISSUES
A. RURAL-URBAN MIGRATIONS
B. RURAL DEPOPULATION
CAUSES
CONSEQUENSES
EFFECTS
STRATEGIES
C. SOCIAL INJUSTICE ISSUES
ACCESS TO RESOURCES
LAND REFORM

3.3 RURAL SETTLEMENT ISSUES

A. RURAL URBAN MIGRATION

RURAL URBAN MIGRATION:
is the MOVEMENT of people from RURAL AREAS to URBAN AREAS in search of employment.

RURAL DEPOPULATION is the process in which POPULATION DENSITY in rural areas DECREASES overtime.

PULL FACTOR is conditions that describe the ATTRACTION of people to an Urban Centers e.g. city.

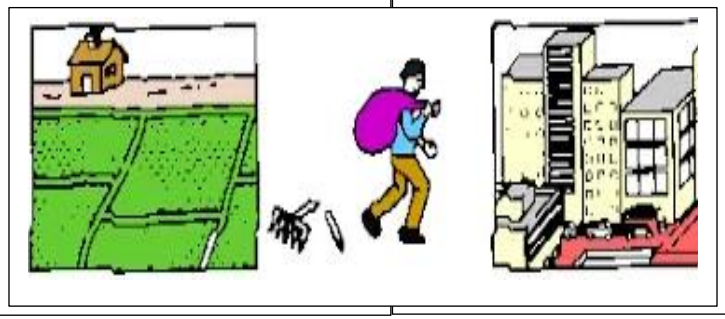
PUSH FACTOR is conditions that describe the movement of people away from the urban centers

SOCIAL JUSTICE ISSUES are complications of the social wellbeing of people and matters affecting their standard of living.

LAND REFORM is a process of addressing matters of landownership. and involves the changing of laws, regulations regarding **land** ownership.
Land reform may consist of a government-initiated or government-backed property **redistribution**, generally of **agricultural land**.

LAND REDISTRIBUTION: is the reallocation of land to the agricultural activities

LAND RESTITUTION: the restoration of land to people who were FORCIBLY REMOVED under DISCRIMINATORY LAWS



B. REASONS FOR RURAL URBAN MIGRATION

- Searching of jobs in urban areas where opportunities of employment are high due to location of industries in these areas.
- Low prices for agricultural product. This makes the income for people living in rural areas low since agriculture is the major source of income in rural areas.
- Nature of education system. In many countries, higher learning institution are in towns making many youths to migrate to towns when they reach college going age.
- Insecurity in some rural areas. In many countries security organs are concentrated in towns making remote rural areas less secure.
- Social services gap between rural and urban areas. In many countries, social services facilities such as referral hospital are in urban areas making them more attractive to rural urban dwellers.

C. CAUSES AND CONSEQUENCES OF RURAL DEPOPULATION ON PEOPLE AND THE ECONOMY

What is rural depopulation?
Rural depopulation is the process in which population density in rural areas decreases overtime. This is caused by the migration of people to urban areas in search of a higher quality of living and employment. Displacement because of large development projects and mining may also cause rural depopulation.

Causes
People migrate for several reasons. These reasons may fall under these four areas: Environmental, Economic, Cultural and Socio-political. Within that, the reasons may also be 'push' or 'pull' factors. Pull factor is a term that is used to describe factors that attract people to a country, region, or city.

Push factor involves conditions that motivate one to leave. Some of the examples of push factors are:

- Unemployment
- Drought or floods
- Crop or livestock disease
- Poor or no health service
- No electricity
- No running water
- Mechanization
- Poor transport link
- Food shortages
- Farm killings

Some of the examples of pull factors are:

- Variety of employment
- Efficient health service
- Safety and security
- Good transport networks
- Electricity
- Running water
- Food security
- Higher wages
- Provision of sanitation services
- Effect of natural disasters less severe



EFFECTS OF RURAL SETTLEMENTS

- Productivity in rural areas drop
- Income declines
- Services close as they are not supported anymore
- Poverty increases
- More people leave the rural areas
- Displacement of families and social problems
- It increases the prices of commodities, housing, and transport in urban areas.
- It increases the rate of unemployment in urban areas since all not all people who come to town to seek employment will be employed
- Economic decline in rural areas because the resources are not utilized due to labor shortage.
- It leads to shortage of social services in urban areas due to increase in population caused by this migration

CASE STUDY THAT ILLUSTRATES EFFECTS OF RURAL DEPOPULATION AND STRATEGIES TO ADDRESS THEM:

To be successful, any strategy to address rural depopulation must take the following points into account:

- To fulfill the basic needs of the local community: food, safe water, sanitation, housing, employment and access to education and health care.
- It must be acceptable to the local community through consultation.
- It must be self-sustainable.
- It must not rely solely on agriculture.
- Improvement must be seen in the short term.
- Support must be given to entrepreneurs.

Social justice issues in rural areas, such as access to resources and land reform.

Social justice issues are problems that affect a person's standard of living. Standard of living refers to the conditions under which you live. All people have the right to have basic needs met: food, shelter, water and security. However, in many rural areas, standards of living are not high enough to meet these basic needs.

Access to resources:

- Food: subsistence farming is common, but soil quality makes it difficult, limiting access to food supplies.
- Electricity: No electricity supplied to rural areas.
- Water: Many people must walk for kilometer to find a clean water source.
- Healthcare: The number and location of clinics and doctors are insufficient and sparse.

Land reform is about returning land to those people who lost their land during the apartheid years. Many black South African were displaced from their ancestral land, which is now owned by commercial farmers.

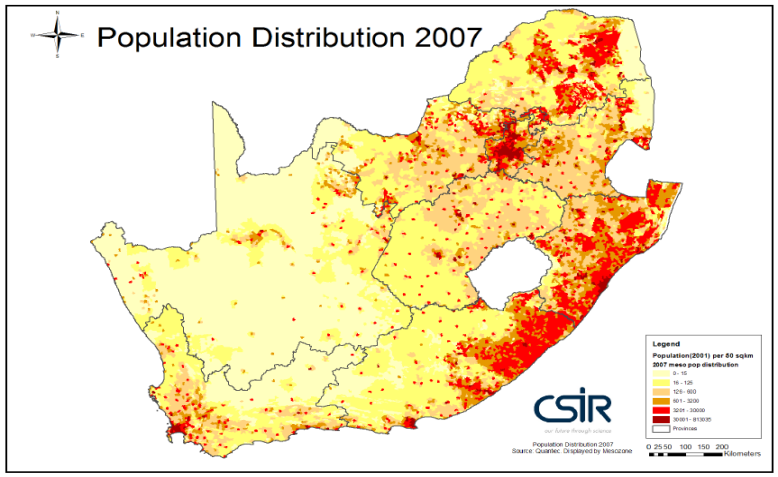
Land redistribution: land is allocated to disadvantaged and poor people for settlement and farming.

C. SOCIAL JUSTICE ISSUES IN RURAL AREAS, SUCH AS ACCESS TO RESOURCES AND LAND REFORM

Rural Development
South African Case Study on Policy and Rural Development

Rural Development Policy in South Africa:
Read the following Articles on government strategies and rural development strategies.

Source 1



The first rural development policy initiatives came directly after the launch of the Reconstruction and Development Programme (RDP) in 1995 by the Ministry in the Office of the President with the release of a discussion document entitled *Rural Development Strategy of the Government of National Unity*. Renewed efforts to design a rural strategy were launched under the auspices of the Rural Task Team of the RDP office.

This process led to the publication of *The Rural Development Framework* by the Department of Land Affairs in May 1997. This framework focused on rural infrastructure, public administration, local government, and rural non-farm employment, but it was not confirmed as government strategy for rural development.

Source 2:

What is the Integrated Sustainable Rural- Development Strategy:

The Integrated Sustainable Rural-Development Strategy (ISRDS)
Confirmed by cabinet as a government strategy following President Mbeki's State of the Nation Address in 1999.
The ISRDS mainly draws from the Sustainable Rural Livelihoods (SRL) approach with strong emphasis on the "poverty agenda". Per a 2001 IDT Report the ISRDS was designed to realise a vision that would "attain socially cohesive and stable rural communities with viable institutions, sustainable economies and universal access to social amenities, able to attract and retain skilled and knowledgeable people, who are equipped to contribute to growth and development".

The Comprehensive Rural Development Programme (CRDP): Introduced in 2009 by President Zuma with the new Department of Rural Development and Land Reform. The key thrust of the framework is an integrated programme of rural development, land reform and agrarian change.

Source 3

Minister Nkwinti's 2010 Budget Speech highlighted that:

The CRDP has set us on a new course for post-colonial reconstruction and development. This shall be achieved through coordinated and broad-based agrarian transformation which will focus on:
Building communities through Social mobilization and institution building;
Strategic investment in old and new social, economic, ICT infrastructure and public amenities and facilities coordinated through the Rural Infrastructure Programme;
A new land reform programme implemented in the context of the reviewed Land Tenure System;
Rendering of professional and technical services as well as effective and sustainable resource management through the component of Geo-Spatial Services, Technology Development and Disaster Management.
Effective provision of cadastral and deeds registry as well as Surveys and Mapping services
The Department is committed to the achievement of outcome 7 of the 12 outcomes pursued by Government over the MTSF period and that is: 'vibrant, equitable and sustainable rural communities'.
The success of this Department over the MTSF period will be measured through delivery on the following outputs:

- Sustainable land reform;
- Food security for all;
- Rural development and sustainable livelihoods; and,
- Job creation linked to skills training.

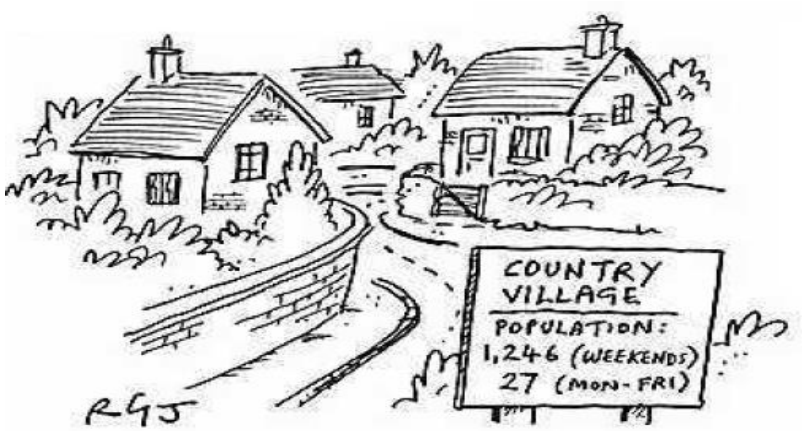
(www.dla.gov.za)

Source 4:

The South African *White Paper on Land Reform:*

The central thrust of land policy is the land reform programme. This has three aspects: *redistribution; land restitution; and land tenure reform.*
Redistribution refers to the transfer of land to recipients who were not necessarily original owners but were nonetheless dispossessed of land under apartheid law. It also aims to provide the disadvantaged and the poor with access to land for residential and productive purposes. Its scope includes the urban and rural poor, labour tenants, farm workers and new entrants to agriculture.
Land restitution refers to the transfer of land back to original owners or their descendants. It covers cases of forced removals that took place after 1913. This is being dealt with by a *Land Claims Court and Commission* established under the *Restitution of Land Rights Act 22 of 1994.*
Land tenure reform is led by a vision of flexible tenure regime that legally secures the rights of people occupying and using land, balancing these rights equitably against rights of owners. The intention is to improve tenure security of all South Africans and to accommodate diverse forms of land tenure, including types of communal tenure. According to Hall (2007) tenure reform policy was intended to address the chaotic state of land administration in the communal areas of former homelands & coloured reserves.
Target: transferring 30% of arable land from large white-owned farms to black small-holders (Extended to 2014).
Source:
The South African *White Paper on Land Reform,* www.dla.gov.za, Tereza & Hall (2007)

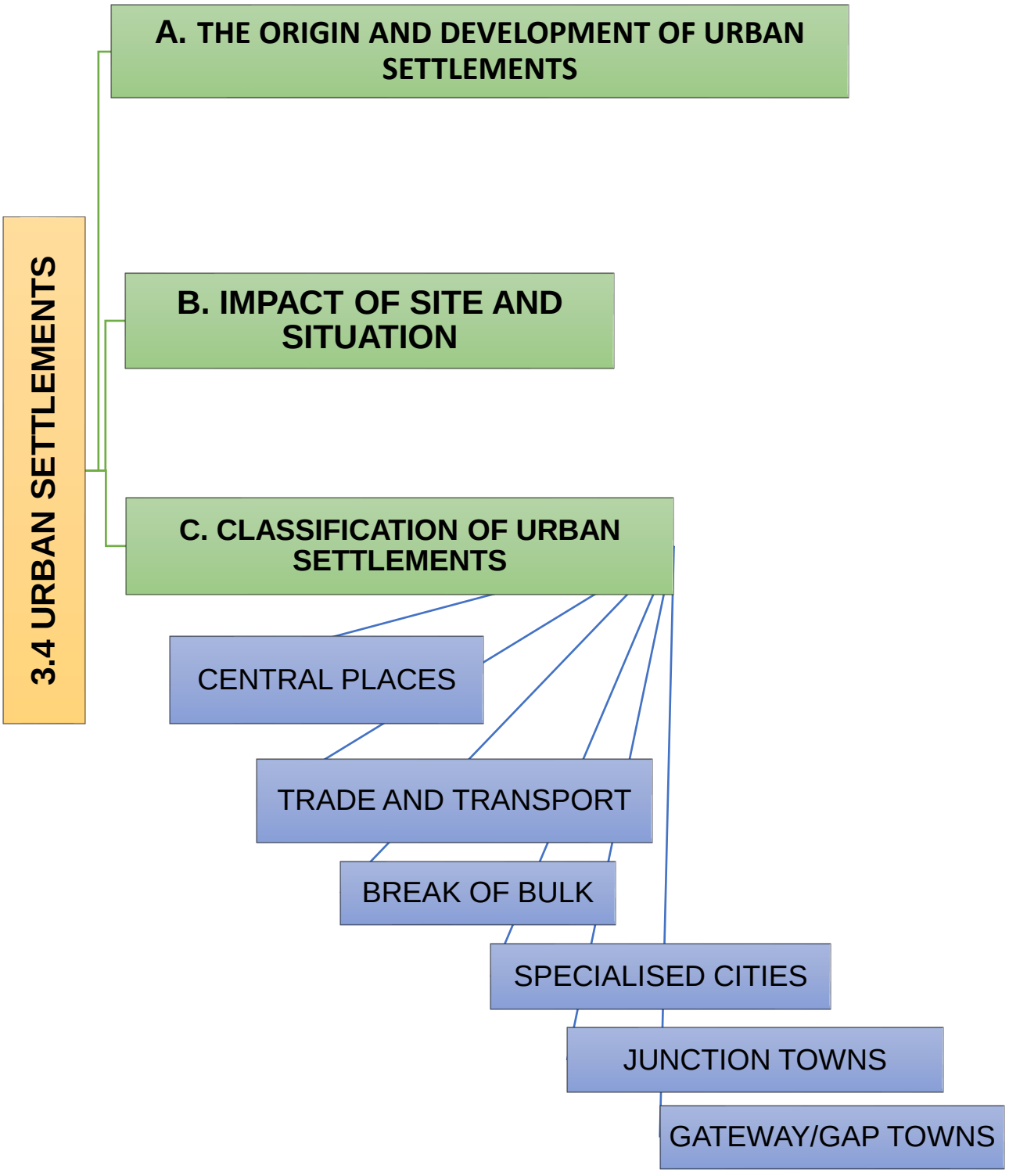
ACTIVITY 3.3 RURAL URBAN MIGRATION



3.3.1 Define the term rural-urban migration. (1 x 1) (1)

3.3.2 Give a reason for the decline in population from Monday to Friday (1 x 2) (2)

3.3.3 In a paragraph of approximately EIGHT lines, outline the consequences of rural depopulation on people and the local economy of the country village. (4 x 2) (8)


3.4 URBAN SETTLEMENTS
A. THE ORIGIN AND DEVELOPMENT OF URBAN SETTLEMENTS
B. IMPACT OF SITE AND SITUATION
C. CLASSIFICATION OF URBAN SETTLEMENTS
CENTRAL PLACES
TRADE AND TRANSPORT
BREAK OF BULK
SPECIALISED CITIES
JUNCTION TOWNS
GATEWAY/GAP TOWNS

3.4 URBAN SETTLEMENTS

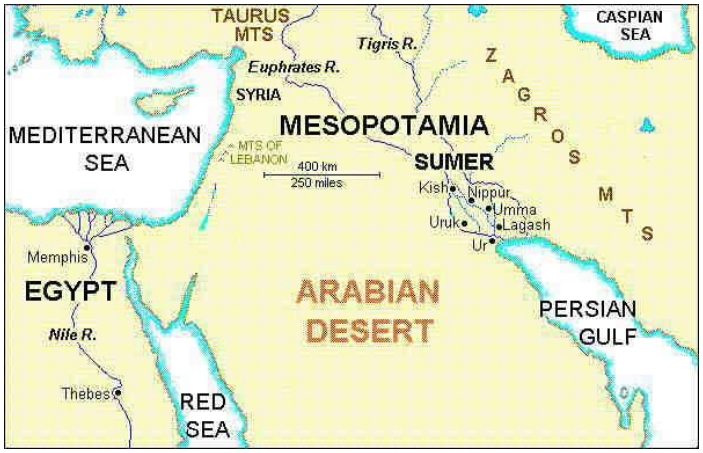
What is an urban settlement:

Any settlement where secondary and/or tertiary activities occur.
Urban settlements are multifunctional

A. THE ORIGIN AND DEVELOPMENT OF URBAN SETTLEMENTS

The origin and growth of the urban area entails the processes of urbanisation, urban growth and urban expansion.

The first known urban settlement originated in Mesopotamia (now Iraq) about 3000 – 4000 BC
Similar settlements occurred later in ancient civilisation in Egypt, The Indus Valley, North East China, and Greece.



(Map showing the location of Ancient Mesopotamia, the first urban settlement)


(Ancient exchange systems and Trade networks)

In the beginning, urban settlements developed when agricultural systems were well established and effective means of transport was available for excess foods

RELATED CONCEPTS

Urban settlement: Multifunctional settlement, dominated by secondary and tertiary activities

Urban growth: An increase in the number of people living in the urban area (can take place without urbanisation)

Urban expansion: The physical growth of urban areas

Urbanisation: A process whereby the percentage of people living in the urban area increases.

Break-of-bulk town/city: Where one type of transport is replaced by another type, e.g. a harbour or port.

Dormitory town/city: A settlement, which is mostly residential, as people work in a nearby city.

Function: Refers to the activities (primary, secondary, or tertiary) that take place in settlements.

Gap town/city: A town or city situated at a point of access over or through a physical barrier, e.g. at a mountain pass.

Hierarchy: Ranking of places from villages to megalopolis OR ranking of functions or orders within an urban centre.

Informal settlement: An informal or unplanned area that is occupied by people who do not have access to formal housing and who erect dwellings on open land, usually on the outskirts of a town illegally. Buildings are made of cardboard, zinc, plastic or wood, or any available materials. It is also called a squatter camp

Junction town/city: Where two major transport routes meet. This can be roads or railway lines.

Land use zones: Areas in an urban area that have a specific purpose or function.

Minimum service area: The minimum area needed to maintain a settlement, service or function.

Initially urban functions included administration, trade, religion, commerce, defence etc.	**Central place town/city**: Provides urban services to surrounding rural area	**Multifunctional:** This is classified as urban because it has both secondary and tertiary activities.

B. HOW SITE AND SITUATION AFFECT THE LOCATION OF SETTLEMENTS

The site is the actual location of a settlement on the earth and is composed of the physical characteristics of the landscape specific to the area. This include factors like availability of water, fuel (wood / electricity), gazing land, fertile soil,

Situation of a settlement is defined as the location of a place relative to its surroundings and other places. Factors included in an area's

FACTORS RESPONSIBLE FOR THE LOCATION OF AN URBAN SETTLEMENT

3.4 A Explain how the following factors influence the location of urban settlements

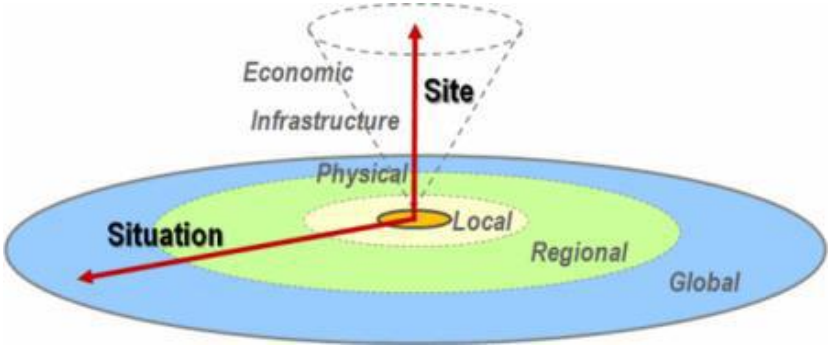
Water

_____

_____

Nature of Soil

situation include the accessibility of the location, the extent of a place's connections with another, and how close an area may be to raw materials if they are not located, specifically on the site.



Factors influencing the Site and Situation of Urban Settlements:

Site: refers to the actual physical terrain (ground) in which the settlement is found.

Situation: The location/placing of the settlement in relation to its broader environment.

Geological Structure

Relief

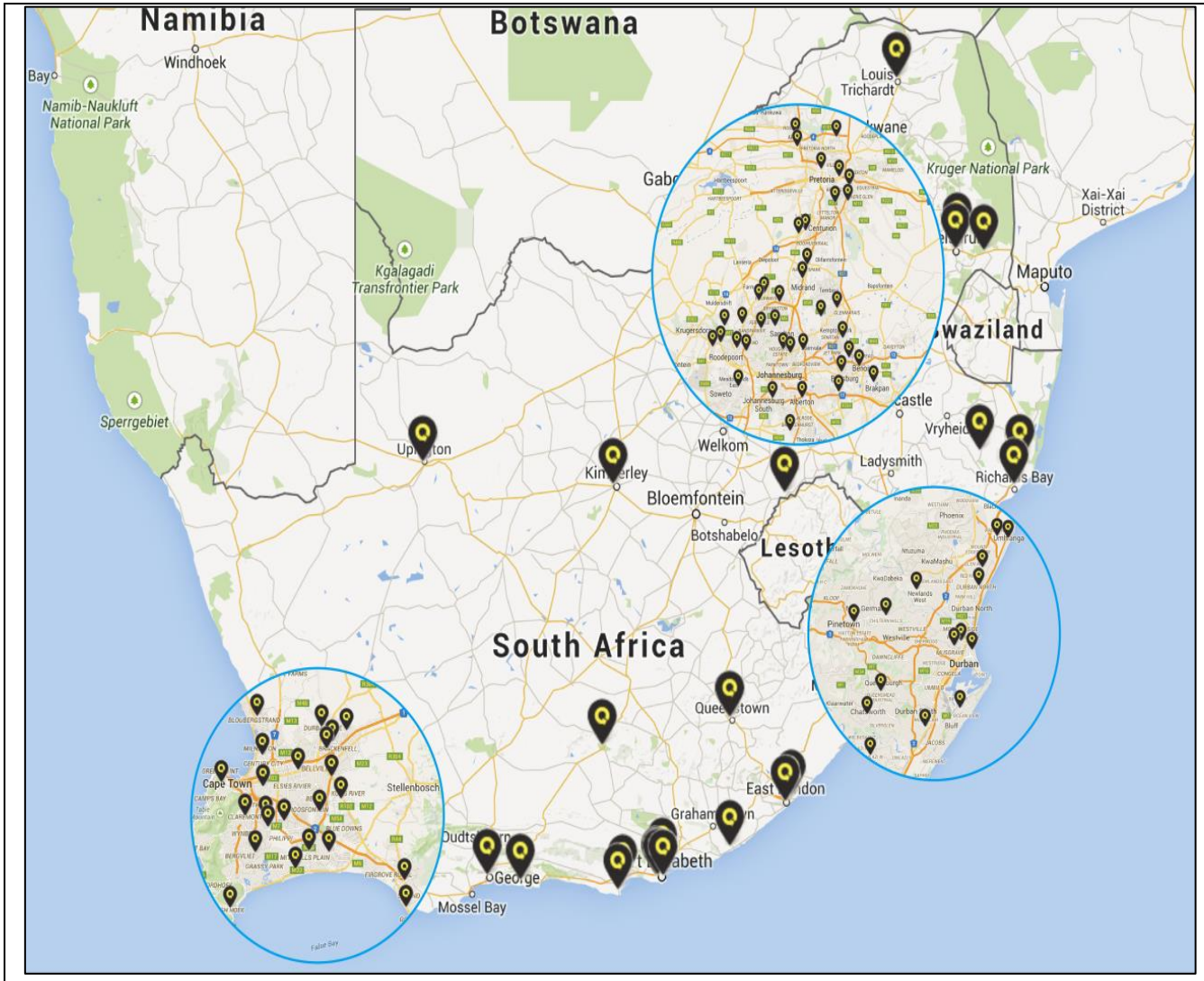
Defensibility

Transport and Trade

Drainage conditions

REFER TO THE MAP OF SOUTH AFRICA

Notice the way in which the urban centres are distributed in South Africa is not regular. The urban centres are randomly dispersed. The South-Western Cape, Gauteng and the Coastal Belt of the eastern Cape and Kwa-Zulu Natal have the most urban centres.



The reason that such an order-less pattern exists is that:

"the location of the city is closely connected to the nature of its main function"

i.e. most towns and cities have come about because of a specific function.
e.g.
Durban – Port (Natural harbour)
Original Mining Towns in Gauteng – Carletonville

The original function of South African towns was determined by the location of the town.

Johannesburg:
There was a need for an urban centre during gold mining. The original location of Johannesburg was determined by mining, today its location is largely influenced by finance and industry

C. CLASSIFICATION OF URBAN SETTLEMENTS PER FUNCTION:

Central Places, Trade and Transport, Break of Bulk points, Specialised cities, Junction towns, Gateway towns, Gap towns



CENTRAL PLACES: This type of town renders the basic services to the surrounding community. All urban settlements have this function but in small towns this may be the only and main function.

TRADE AND TRANSPORT TOWNS: These towns develop at important transport route intersections and the most important activity is trade with the surrounding settlements.

BREAK-OF-BULK POINTS: This type of town develops where different types of transport methods are linked and bulk freight is either distributed with other transport methods of freight and sent off in bulk to other markets. E.g. Durban

SPECIALISED TOWNS: These towns only specialise in one function e.g. Mining towns: most important activity is mining e.g. Potchefstroom

RESORT TOWNS: some natural attraction lead to the development of the town e.g. coastlines, warm water sources, ski resorts, springs etc.

INDUSTRIAL TOWNS: the most important activity is industries. E.g. Sasolburg in SA.

JUNCTION TOWNS develop at major transport junctions: e.g. De Aar developed at the major junction between the North / South and West East railways in SA. Germiston is also at a major rail junction in Gauteng.

GATEWAY/GAP TOWNS develop where there in only one bridge over a river or one pass through a mountain. In this gap / gateway where all travellers need to pass a town will develop.

ACTIVITY 3.4
CHOOSE TERMINOLOGY FROM FIGURE 3.4 A and 3.4 B TO MATCH THE STATEMENTS BELOW.

3.4.1 Movement of people from rural areas to cities _____

3.4.2 Movement of people from cities to rural areas _____

3.4.3 A term that describes the physical growth of a city _____

3.4.4 An area of decay on the outskirts of the CBD _____

3.4.5 Refers to the modernisation of old houses by wealthy people _____

3.4.6 A feature that prevents urban sprawl _____

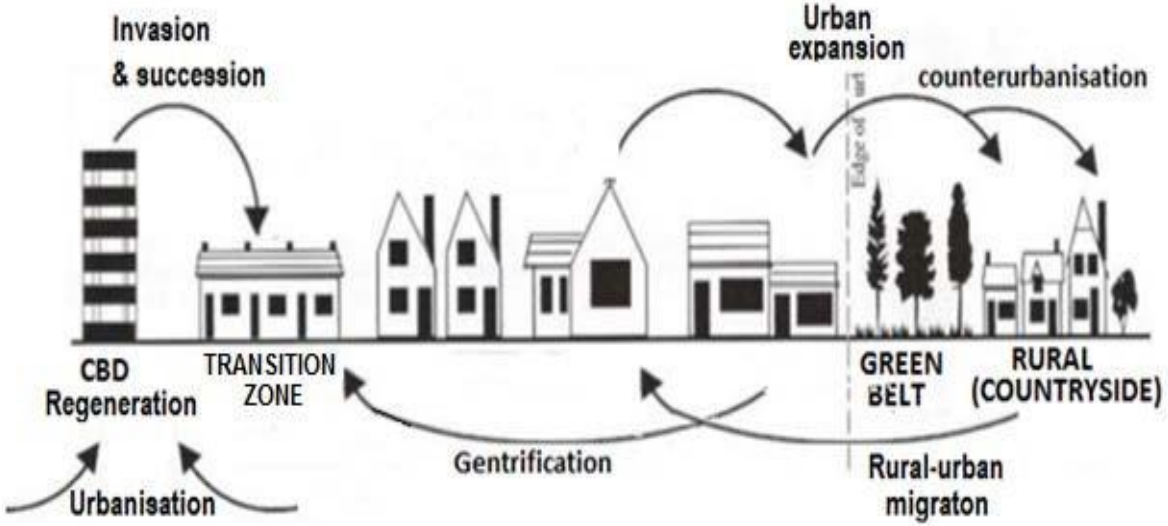
3.4.7 Renovation of buildings to reduce migration and improve the urban environment _____

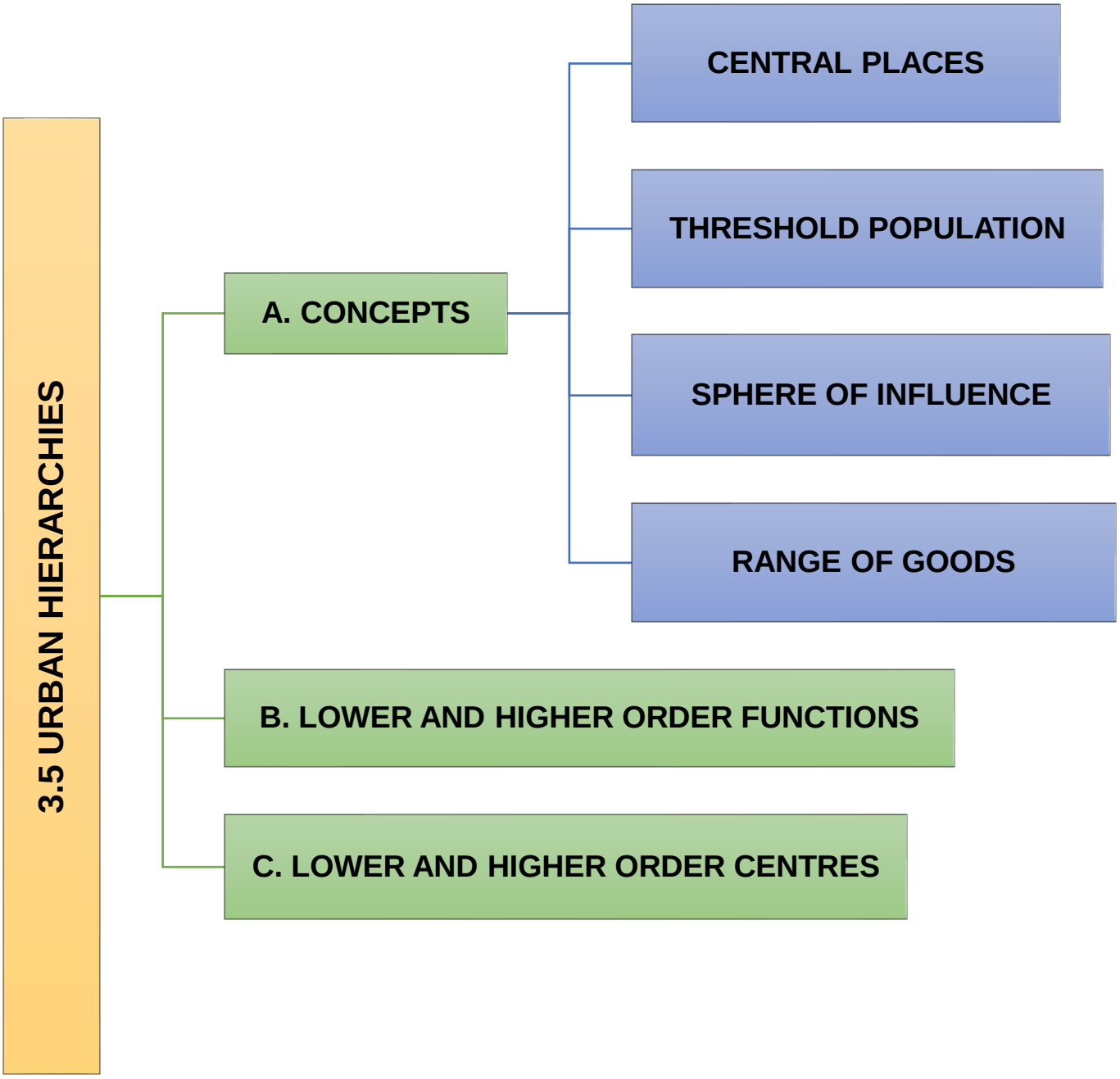
3.4.8 The percentage increase of people living in cities _____

FIGURE 3.4 A



FIGURE 3.4 B




3.5 URBAN HIERARCHIES
A. CONCEPTS
CENTRAL PLACES
THRESHOLD POPULATION
SPHERE OF INFLUENCE
RANGE OF GOODS
B. LOWER AND HIGHER ORDER FUNCTIONS
C. LOWER AND HIGHER ORDER CENTRES

A. THE CONCEPTS OF URBAN HIERARCHY, CENTRAL PLACE, THRESHOLD POPULATION, SPHERE OF INFLUENCE AND RANGLE OF GOODS

THE CENTRAL PLACE THEORY

The Central Place Theory offers the best explanation for the distribution of central places. It is the most influential theory in the understanding of **(urban)** human geography.

The foundations of the Central Place Theory were developed by a German Geographer – Walter Christaller.

The central place theory involves more than distribution of Central places, Christaller extended the theory to include the HIERACHICAL ORGANISATION and SPHERES OF INFLUENCE of Central Places.

Central Places are not the same SIZE

With respect to SIZE it is possible to arrange central places per a RANKING order.

The URBAN HIERARCHY of CENTRAL PLACES categorises urban centres per the number and degree of specialisation of functions

Every function has its own threshold population and range

THE URBAN SETTLEMENT HIERARCHY (RJ Davies)

CATEGORY OF SETTLEMENT	EXAMPLE IN SOUTH AFRICA
PRIMATE METROPOLITAN	GREATER JOHANNESBURG (PWV Region)
MAJOR METROPOLITAN	PRETORIA, DURBAN, CAPE TOWN
METROPOLITAN AREA	BLOEMFONTEIN, PORT ELIZABETH
MAJOR COUNTRY TOWN	NELSPRUIT, NEWCASTLE
COUNTRY TOWNS	HARRISMITH, BEAUFORT WEST
MINOR COUNTRY TOWNS	MUSINA
LOCAL SERVICE CENTRE	FRANSCHOEK
LOW-ORDER SERVICE CENTRE	VAN REENAN, CLARENS

Sphere of Influence

- The ability of an urban centre to provide a variety of urban services to its surrounding urban and rural environments

Threshold Population

- The minimum number of people require to support a good or a service in an urban centre

Range

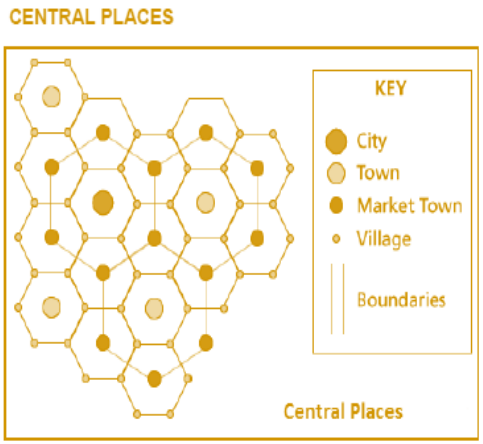
- The maximum distance from which a good or service can draw its customers

The position of a town in the hierarchy is determined by its function, not necessarily by its population size.

- In 1967 Professor RJ Davies (South Africa) developed EIGHT hierarchical categories based on the classification of the number and type of functions offered by an urban settlement.
- **Each type of function was given a numerical weighting e.g. if an urban centre had a university it was allocated 40 points and if an urban centre had a bank it was allocated 1 point.**
- Each town in South Africa was given a numerical value – **This is known as the towns INDEX OF CENTRALITY**

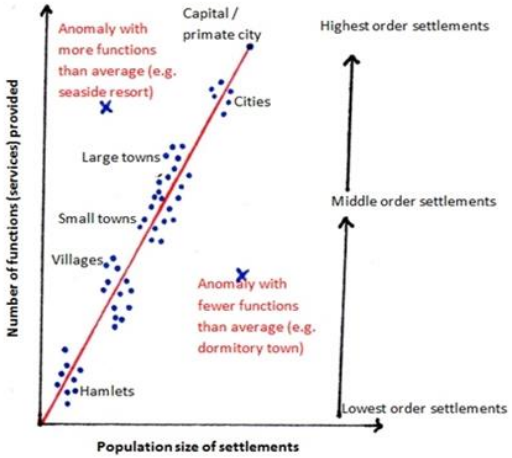
B. LOWER ORDER AND HIGHER ORDER CENTRES, FUNCTIONS AND SERVICES

THE CENTRAL PLACE THEORY

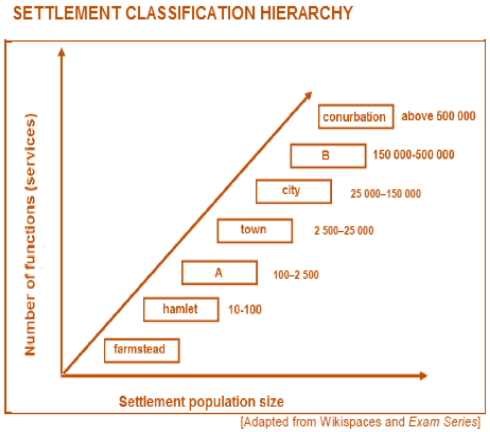


[Source: http://www.watd.wuthering-heights.co.uk]

THE RELATIONSHIP BETWEEN POPULATION SIZE AND NUMBER OF FUNCTIONS



C. THE CLASSIFICATION OF SETTLEMENT HIERARCHY



[Adapted from Wikispaces and *Exam Series*]

HIGH AND LOW ORDER GOODS



D. LOWER AND HIGHER ORDER CENTRES

Low-order Centre

- Central places with a small threshold population, few services and mainly low-order services

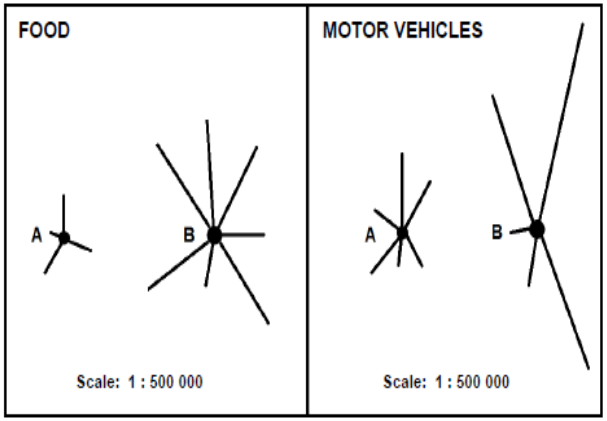
High-order Centre

- Central places with a large threshold population offering many services and mainly high-order services

Low- order Service

- Things we need virtually every day e.g. daily groceries, bread, milk

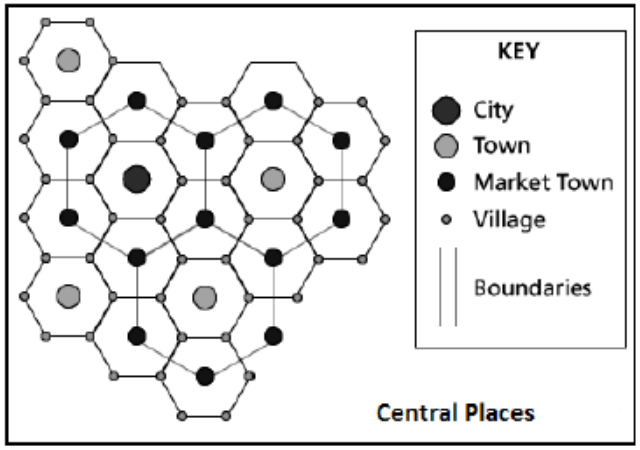
SPHERE OF INFLUENCE AND RANGE



[Source: Examiner's own sketch]

ACTIVITY 3.5

CENTRAL PLACES



[Source: http://www.watd.wuthering-heights.co.uk]

3.5.1 What is a central place (1 x 1) (1)

_____

3.5.2 What is the main function of a market town (1 x 2) (2)

3.5.3 State the relationship between a high order service and range of goods (1 x 2) (2)

_____

_____

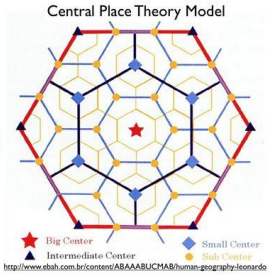
_____

3.5.4 Write a paragraph of approximately EIGHT lines to explain the impact of locating a high-order service in an area with a low threshold population (4 x 2) (8)

Central Place Theory

- **Central Place Theory** is a spatial theory in **urban geography** that attempts to explain the reasons behind the **distribution patterns, size**, and number of **cities and towns** around the **world**.

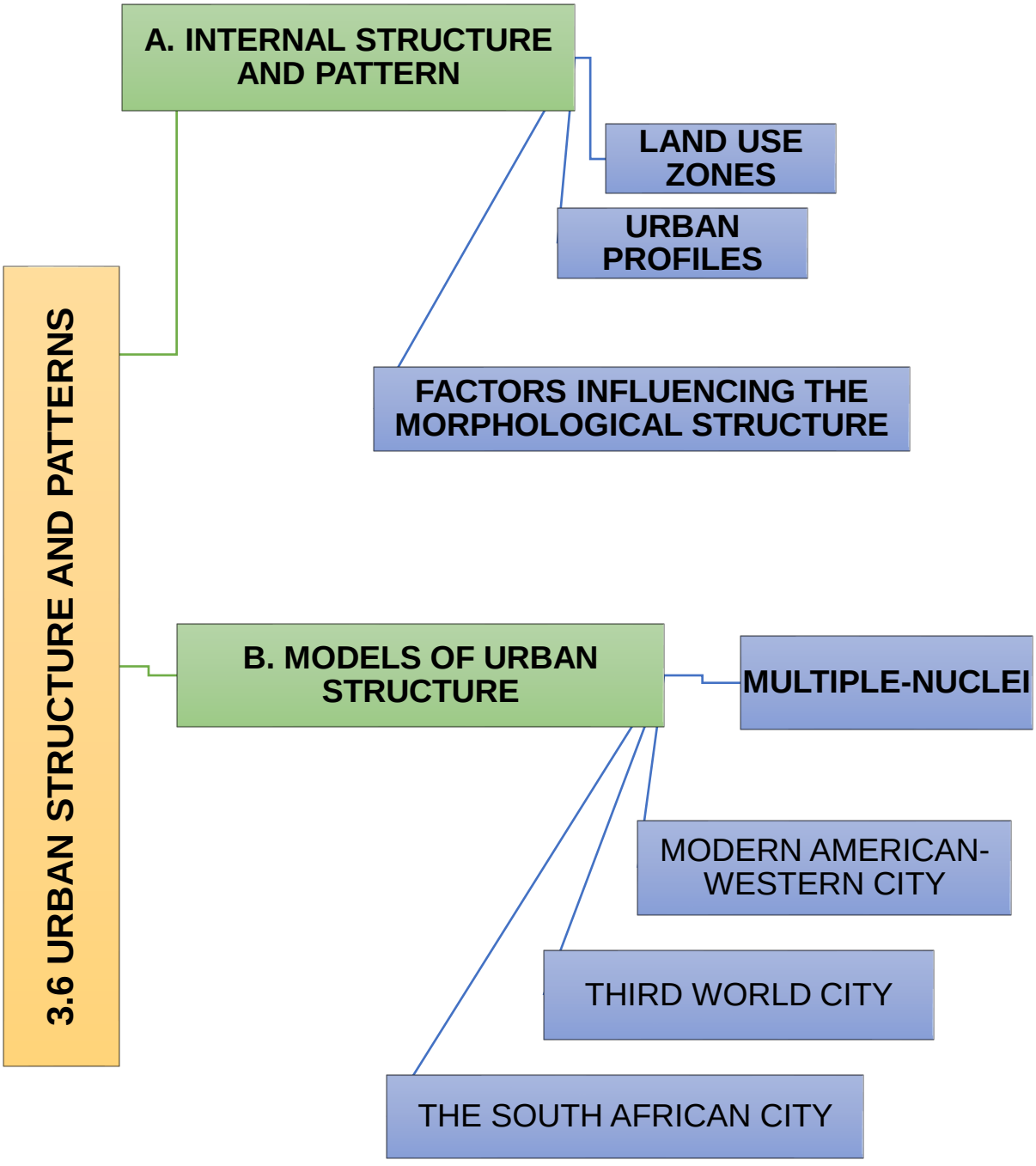
Studied for Historical Reasons



Studied for Locational Patterns

3.5.5 Illustrate by means of a diagram the difference in range and sphere of influence between a motor vehicle and bread (4 x 2) (8)

Motor Vehicle	Bread


3.6 URBAN STRUCTURE AND PATTERNS
A. INTERNAL STRUCTURE AND PATTERN
LAND USE ZONES
URBAN PROFILES
FACTORS INFLUENCING THE MORPHOLOGICAL STRUCTURE
B. MODELS OF URBAN STRUCTURE
MULTIPLE-NUCLEI
MODERN AMERICAN-WESTERN CITY
THIRD WORLD CITY
THE SOUTH AFRICAN CITY

A. INTERNAL STRUCTURE AND PATTERNS OF URBAN SETTLEMENTS: LAND USE ZONES

THE CENTRAL BUSINESS DISTRICT (JHB)



THE CENTRAL BUSINESS DISTRICT (PTA)



The CBD is the most accessible part of the city. All the main inner city and intercity traffic routes meet here. This is the commercial heart of the city. ***There is a variety of shops and offices which can attract clients from far and near. The whole city and its sphere of influence can be served from here***. High-order functions especially are in the CBD which need a large threshold population (the minimum number of clients needed for a certain business to survive). Examples are the stock exchange, an opera house, or municipal head offices. The functions must therefore be easily accessible to all residents. Retail businesses such as department stores, clothes shops, jewellers, furniture businesses and specialised bookshops are also found in the CBD.

Tall office buildings house the following functions:

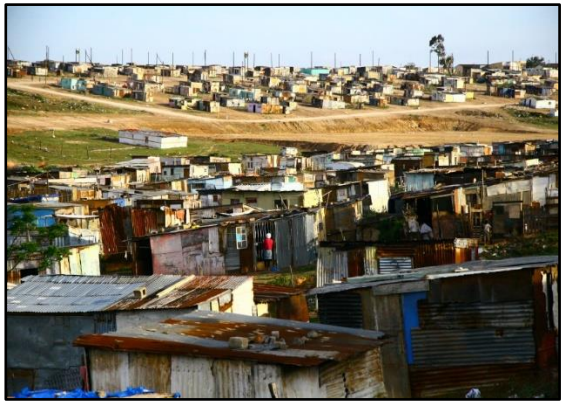
- Financial institutions (banks, building societies and insurance companies)
- Professional services (lawyers, doctors, accountants, architects)
- Administrative services (governmental, provincial and local) • Entertainment (cinemas and theatres) Hotels and good restaurants, Terminals for railway, bus and air services, big parking garages and open parking lots. Low-order functions

THE TRANSITIONAL ZONE (ZONE OF DECAY)



Lies on the periphery of the CBD, but seldom right around it. The buildings are usually in a state of decay and sometimes uninhabitable. Water pipes are leaking, and the electrical wiring causes short- circuits. Low-order functions, which are very mixed, occur throughout the area. The neglected slum conditions of an area result from its proximity to the CBD and the age of its buildings. ***Land values are high because the zone is the future expansion area of the CBD.*** The owners do nothing to repair or replace the old dilapidated buildings because they know that they will be sold for large sums later. One of the main problem areas in a city is the zone of

	such as cafés, hairdressers, chemists and dry cleaners also found in the CBD.	decay and, it is therefore, often the scene of large renewal projects

THE RESIDENTIAL ZONE (SOUTH AFRICA) Formal residential	Informal residential	Suburban residential
		
Residential areas cover approximately 50% of the total built-up surface of the city. The figure is considerably higher than it was previously because families are smaller nowadays. Today, the CBD no longer has a definite residential function. However, the zone of decay surrounding it has a high residential density. People are crowded together in semi-detached houses and other low-grade multi-storey houses because of higher land prices. Outside the zone of decay, we find a better	Informal settlements are characteristic of Third World countries. They are established when millions of impoverished rural dwellers stream to the city to look for work and a better quality of life. They live in on the outskirts of cities/towns in shacks which are erected in a disorderly fashion. This is very common in South Africa. Unhygienic conditions prevail. There is poor sanitation and almost no municipal services. Suburban growth Socio-economic class differences – separate	Suburban growth takes place on the outskirts next to traffic routes leading out of the city. This is a feature of urban development. The huge physical expansion of residential suburbs is basically made possible by improved means of transport within the city. Suburbs have their own suburban shopping centres and supply the residents with residential, work and shopping needs.

class of area with flats also with a high population density.	residential areas develop. population – differences religion, language, and culture	Residential separation: Most people prefer to live near people who share their social, economic, and cultural characteristics.

THE INDUSTRIAL ZONE (SOUTH AFRICA)

A HEAVY INDUSTRIAL ZONE



In general, industries in the biggest cities are established on the outskirts due to air and noise pollution, foul odours, and heavy transport facilities (railway and road). Large land surfaces, raw materials, and low-cost labour (mainly manual labour) are needed for industries. The location of heavy industries in the city is determined by several factors:

- Their absolute dependence on mass transport facilities, e.g. harbours, canals, railways, and large, heavy vehicles.
- This requires large pieces of cheap, level ground.

A LIGHT INDUSTRIAL ZONE



Light industries are found in and around the zone of decay. Thus, they are mixed among wholesale businesses, low-grade housing, etc. They are in the oldest industrial area of the city. The large variety of small, light industries, e.g. clothing factories, printers, and jewellery manufacturers, is typical of this area. They are situated in multi-storey buildings. The industries are strongly interdependent. They prefer a central location where clients can be reached quickly and directly. The lack of space and cheap land restricted the expansion of the CBD and forced industries to move outwards. Light industries, e.g. metalworks,

The two factors usually cause heavy industries to be established on the outskirts of cities as their activities usually go hand in hand with smoke, noise, foul odours, and possible dangers such as accidents.	food, and furniture factories, moved to the suburbs. Suburban light industries are usually established near important traffic routes leading out of the city to speed up the dispatch of their products.

FUNCTIONAL LANDUSE and THE URBAN PROFILE

FUNCTIONAL LAND USE'S

THE RURAL URBAN FRINGE



This location within an urban area is not classified as zone but displays functional characteristics of compatibility. This land use is located on the outskirts of the more densely built-up city area. The transitional area is where residential land use is found in patches to a rural area. Around the modern big city

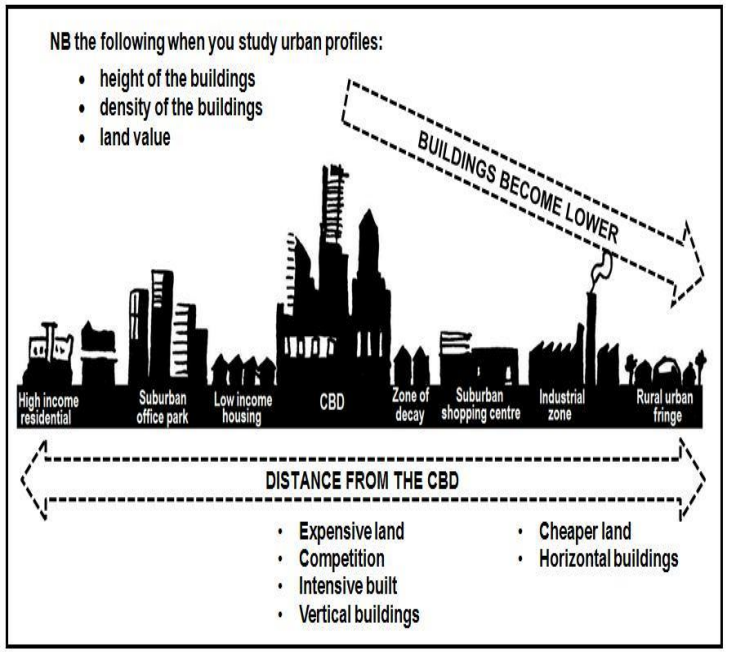
THE RURAL URBAN FRINGE

(OR TAMBO International Airport)



Urban dwellers can settle outside the city totally but can still stay in contact with urban activities daily. Examples of activities which occur here are airports, power stations, sewerage farms, cemeteries, potential urban industries

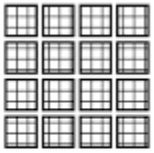
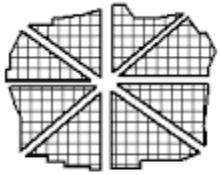
THE URBAN PROFILE



This is the side view of cities, i.e. the city seen from the side. The height of buildings is observed. The highest buildings are in the city centre because of high land prices. The land is therefore utilised intensively. Because of the lower land prices, the

there is a broad fringe area where urban functions gradually infiltrate the rural area. There is no definite division between rural and urban functions. The transitional area has developed because of faster transport facilities	and scrapyards, golf courses and racecourses. Smallholdings are found in the fringe areas of South African cities and towns. The owner usually works in the city. Smallholdings are an urban rather than a rural phenomenon.	buildings become increasingly lower the further they move away from the CBD. Many cities have a second concentration of skyscrapers a short distance away from the city centre, e.g. Hill brow in Johannesburg.

THE MORPHOLOGICAL STRUCTURE OF A CITY

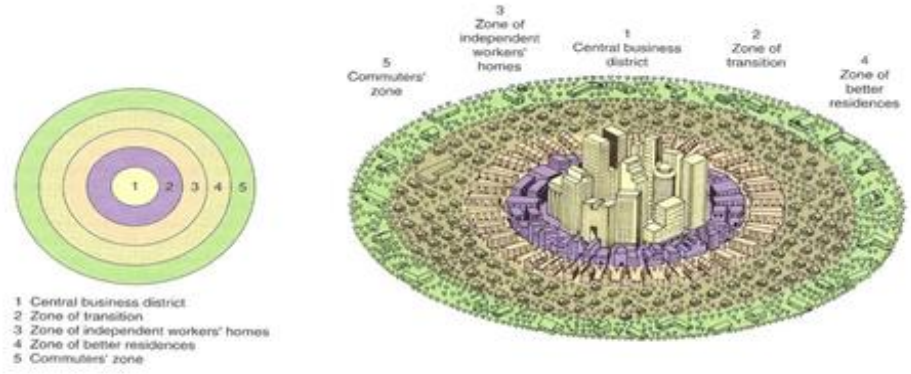
THE GRID IRON STREET PLAN	THE RADIAL CONCENTRIC STREET PLAN	THE IRREGULAR STREET PLAN
		
 Grid	 Radial	 Irregular

Gridiron e.*g. central Johannesburg. The streets intersect at right angles.* **Advantages:** Easy to layout Easy to extend(subdivide) **Disadvantages** too many intersections hamper traffic flow waste time, petrol, money, stop and go	**Radial concentric (cobweb)** *Streets radiate from central point and have service streets intersecting them at various distance from the central point.* **Advantages** Fewer intersections **Disadvantages** Construction and maintenance is very expensive	**Irregular** *Streets blocks of all shapes and sizes occur and there are no dominant focal points.* This could have resulted from the nature of topography, no planning or modern planning techniques **Can be planned or unplanned**

B. MODELS OF URBAN STRUCTURE: THE MODERN AMERICAN- WESTERN CITY

MODELS OF URBAN STRUCTURE IN THE AMERICAN CITY

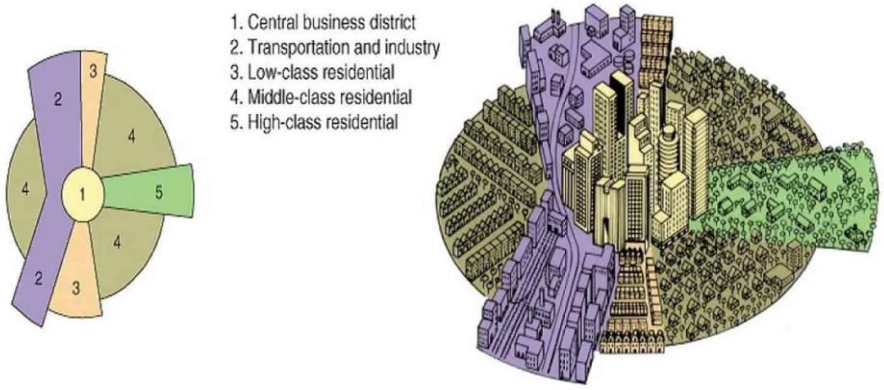
THE CONCENTRIC ZONE MODEL – CHICAGO - USA



CHARACTERISTICS OF THE MODEL:

- This model is called the concentric zone model, which states that cities can develop in five concentric rings. The inner zone of the

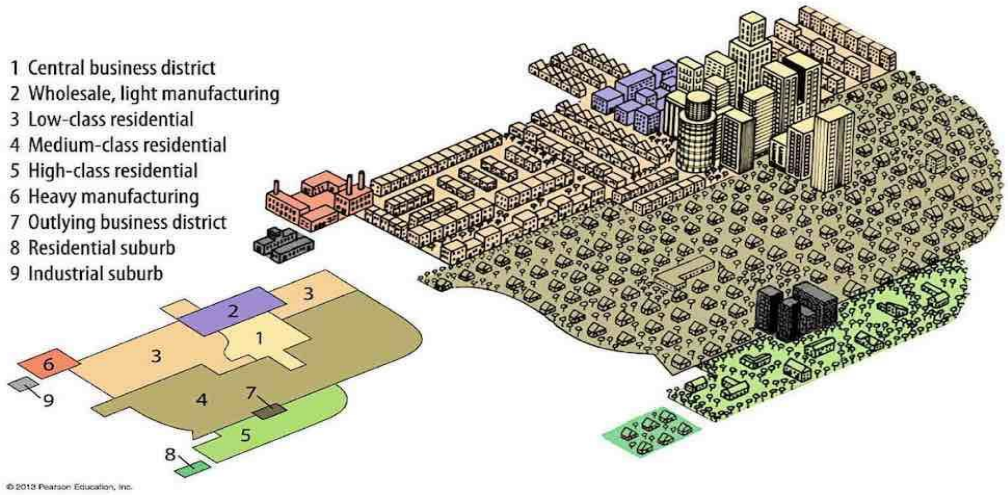
THE HOYT SECTOR MODEL – CALGARY-CANADA AND THE USA



cities tends to be the CBD, followed by a second ring that tends to the zone of transition between the first and third rings. In this transition zone, the land tends to be used by industry or low-quality housing. • The third ring is called the zone of independent workers and tends to be occupied by working-class households. The fourth ring is called the zone of better residences and is dominated by middle-class families. Finally, ring five is called the commuter's zone, where most people living there must commute to work every day.	**CHARACTERISTICS OF THE MODEL:** • This model for city development and growth is called the sector model. This model states that cities tend to grow in sectors rather than concentric rings. The idea behind this model is that "like groups" tend to grow in clusters and expand as a cluster. The centre of this model is still the CBD. The next sector is called the transportation and industry sector. The third sector is called the low-class residential sector, where lower income households tend to group. The fourth sector is called the middle-class sector and the fifth is the high-class sector.

THE MULTIPLE NUCLEI MODEL

THE MULTIPLE NUCLEI MODEL



REASON FOR THE MODEL

Harris and Ullman argued that cities do not grow a single nucleus but several separate nuclei

- Each nucleus acts like a growth point
- The theory was formed based on the idea that people have greater movement due to increased car ownership
- This increase of movement allows for the specialization of regional centres
- The number of nuclei around which the city expands depends upon situational as well as historical factors Reasons for the Model Continued

CHARACTERISTICS OF THE MODEL

EFFECTS ON INDUSTRY

- As multiple nuclei develop, certain types of transportations like airports are created
- Those allow industries to be established with a reduction in transportation cost
- These transportation hubs have negative effects
- Some effects are noise pollution and lower land values
- Hotels are also built around airports because people who travel want to be near their source of transportation

PLACEMENT OF CLASSES

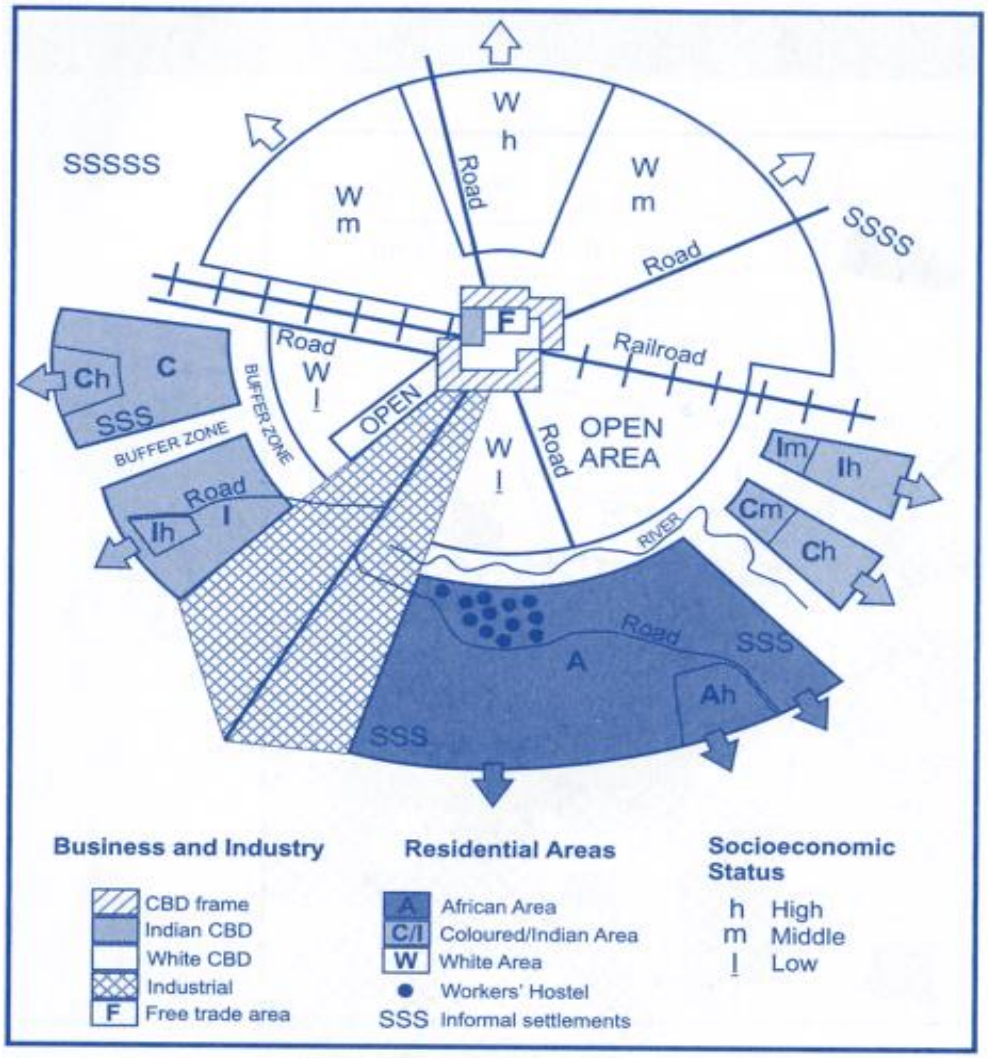
- **Low Class:** Low class residential area are closer to the manufacturing jobs which tend to be non-minimal skilled jobs. They also tend to have low wages which in turn lead to a low-class resident

- **Medium Class:** Medium class residential area tends to be close to the CBD. It also has more space to spread out to support the population which are doing the skilled-labour jobs

- **High Class:** High class residential areas tend to be on the outskirts of the medium class residential area. The area is also touching the outlying business district. The jobs that the people in this district do are usually skilled labour and have high incomes.

MODELS OF URBAN STRUCTURE: THE SOUTH AFRICAN CITY

The South African Apartheid City



CHARACTERISTICS OF THE MODEL:

Apartheid planning

Large scale rural-urban migration due to opportunities in the urban area led to the growth of formal and large-scale informal settlements.

Changing Urban Patterns and Land Use and the South African City

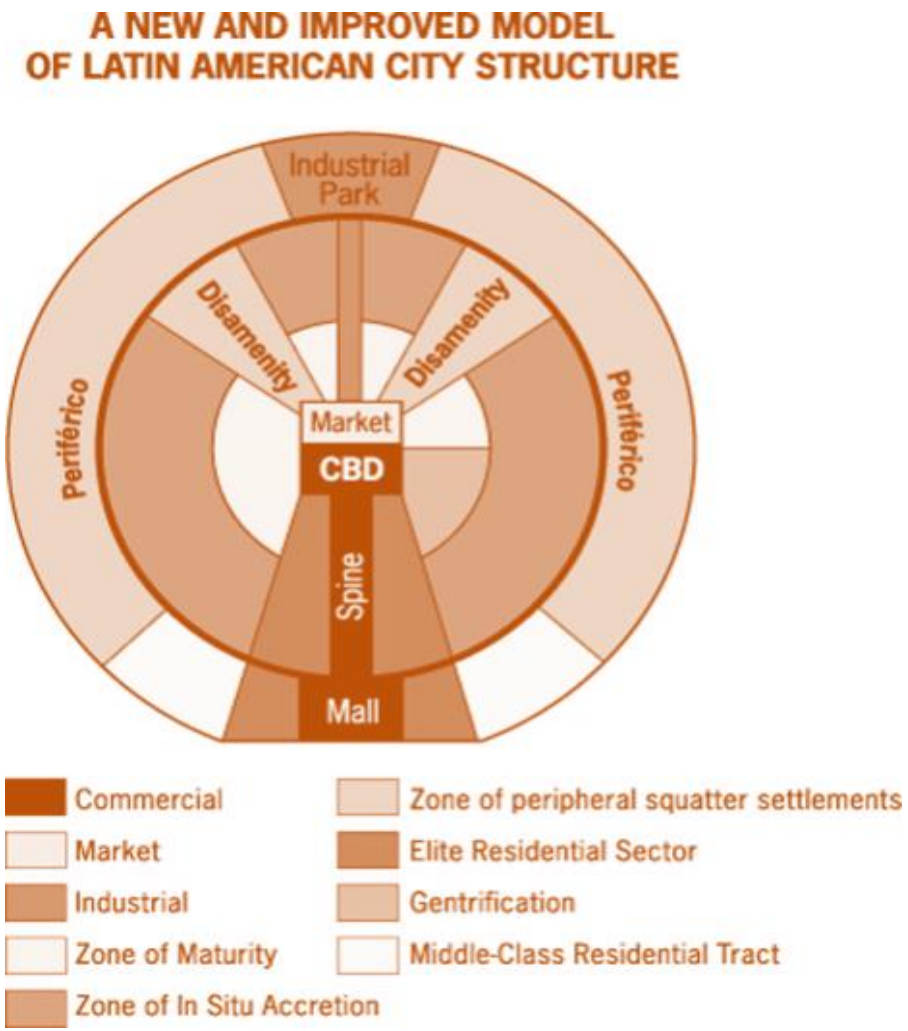
- Urban renewal
- Re-engineering growth of the urban area
- Facadism keeping the external front of the building but modifying the rest of the building
- Gentrification- upgrade run down areas in the inner city
- Invasion and succession-one inappropriate land use replaced by another more appropriate land use e.g. residential to commercial.
-

Decentralisation of functions

- Commercial functions moving to the residential area
- Convenience of having different functions in one area

MODELS OF URBAN STRUCTURE, THE LATIN AMERICAN CITY MODEL

LATIN AMERICAN CITY MODEL



CHARACTERISTICS OF THE MODEL-

- The model above was updated in 1996 from the original version in 1980 published by Ernest Griffin and Larry Ford. As with all models, it is a simplified version of the common features of cities. In the model:

The Central Business District is the commercial heart of the city. The most historic part of the city surrounds the CBD and contains a mixture of old colonial buildings along with more modern hi-rise development.

There is also a commercial 'spine' along major roads, which extends the CBD outwards from the centre towards edge-of-city retail parks ('malls' on the diagram below).

The elite housing zone is the highest class residential area, and it exists near to the commercial districts because the time taken for journeys is generally very long due to traffic congestion, so wealthy people avoid travelling long distances between their homes and work. The 'peripherical' is a ring-road that helps traffic move around the edge of the city

The periphery (or periphery – meaning 'edge') is the home of the poorest people, who are generally new migrants to the city. They settle on the outer edges of the city because there is no space to occupy in the middle of the city, and they are too poor to afford the rent.

	These ‘zones of disamenity’ are squatter settlements but they gradually improve into permanent residential areas.

URBAN STRUCTURE AND PATTERNS

CHANGING URBAN PATTERNS AND LAND USE IN SOUTH AFRICAN CITIES

FIGURE A – The model apartheid city, showing residential and industrial areas and central business districts (1981)

FIGURE B – The late apartheid city (1989)

FIGURE C – The post-apartheid city (2001)

FIGURE D – Map of Johannesburg

FIGURE A

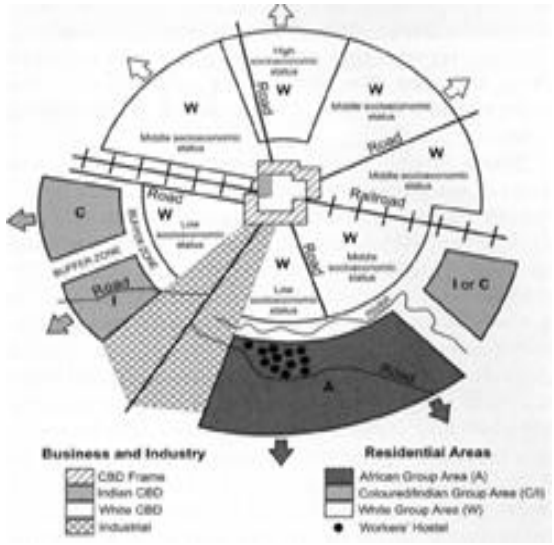


FIGURE B

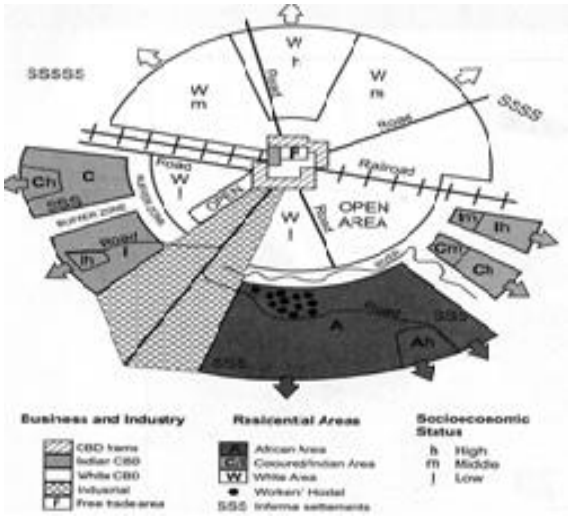


FIGURE D

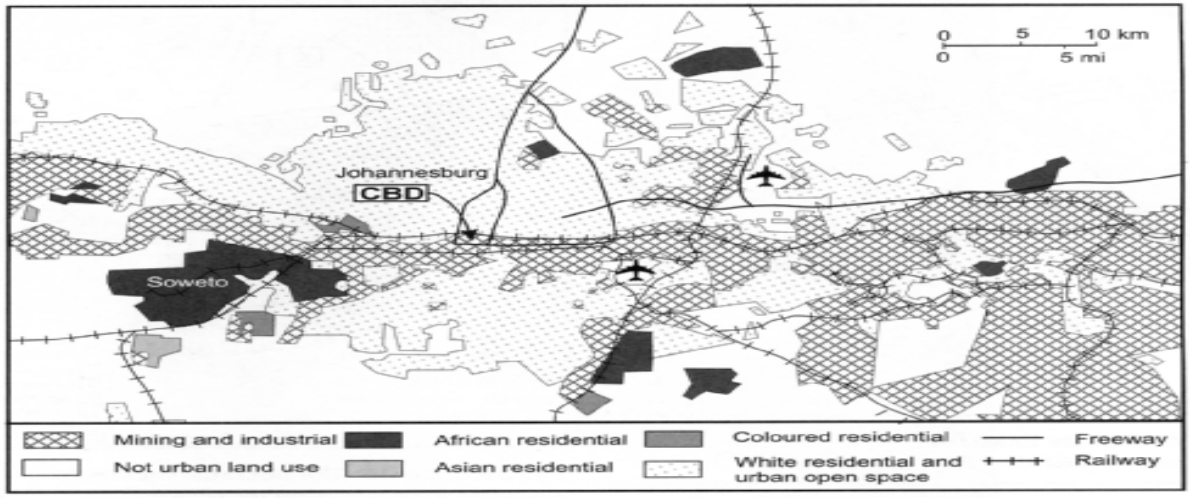
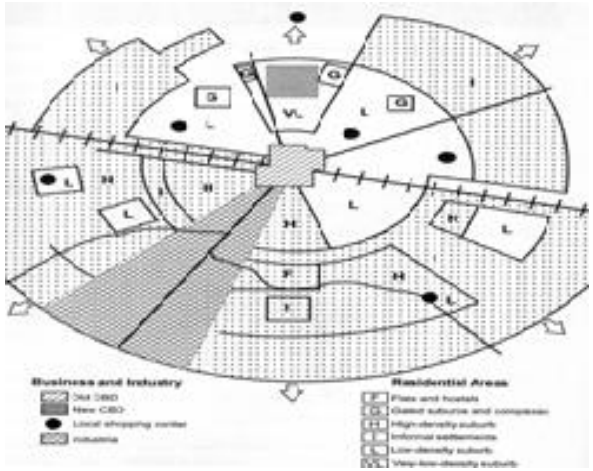
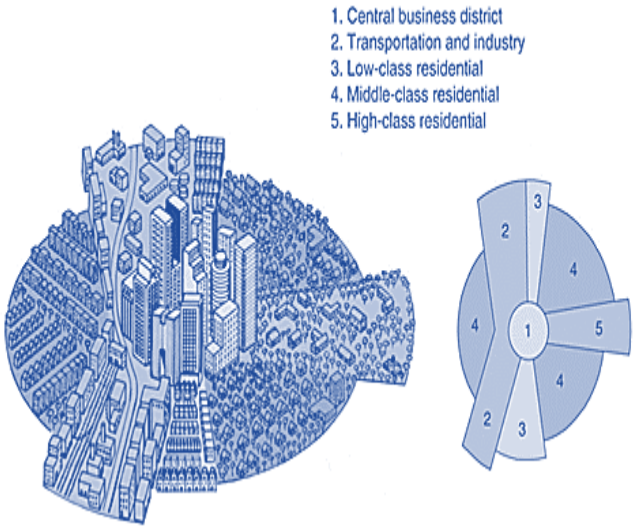


FIGURE C



ACTIVITY 3.6

FIGURE 3.6 THE HOYT SECTOR MODEL



Homer Hoyt



3.6 Refer to FIGURE 3.6 on the Hoyt Model of Urban structure

3.6.1 Why is this model commonly referred to as the sector model (1 x 1) (1)

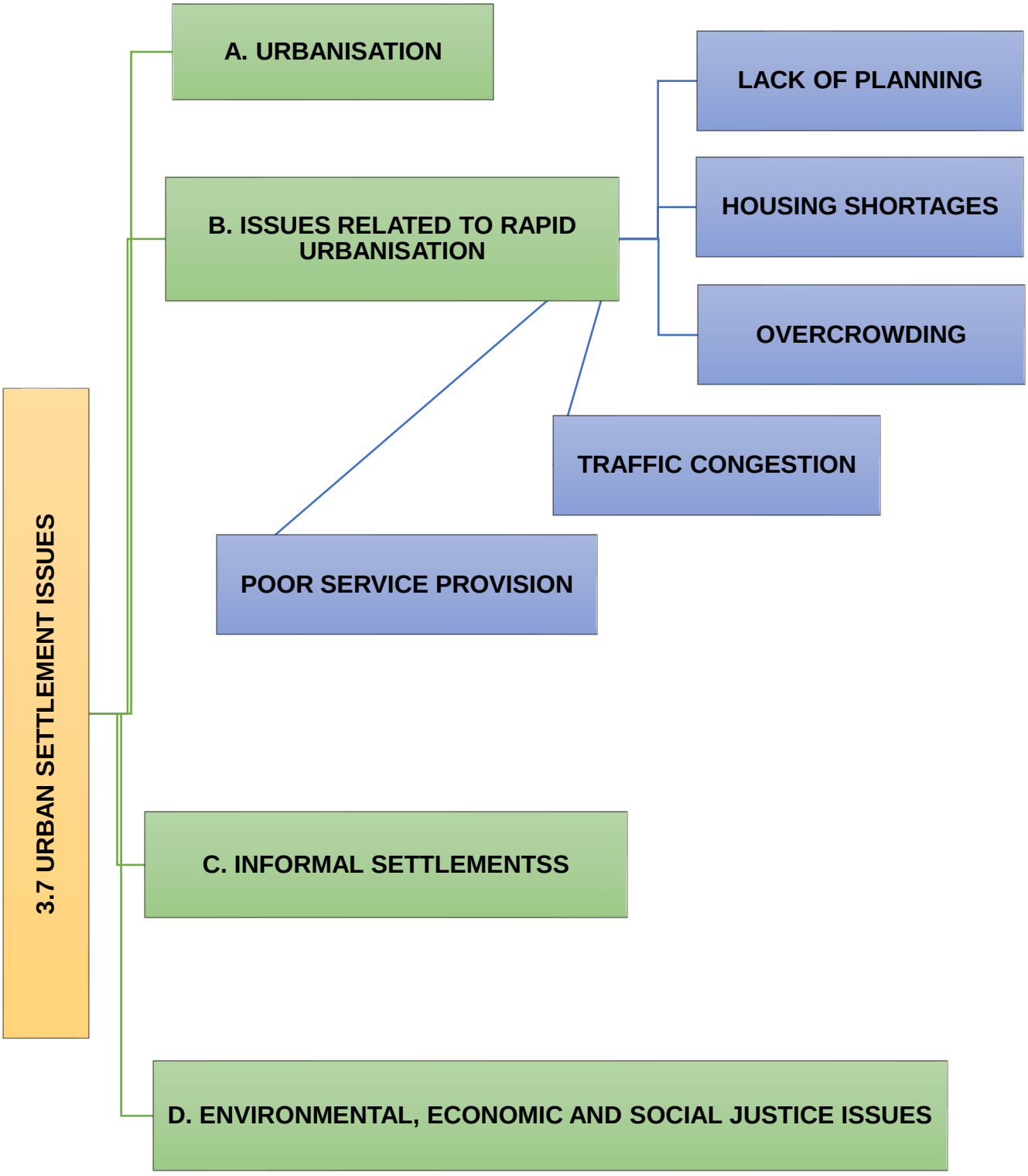
3.6.2 Give a reason for your answer to QUESTION 3.4.1. (1 x 2) (2)

3.6.3 Why is the Hoyt model considered to be a modification of the Concentric zone model? (1 x 1) (1)

3.4.4 State ONE weakness of this model of urban structure when compared to South African cities today. (1 x 1) (1)

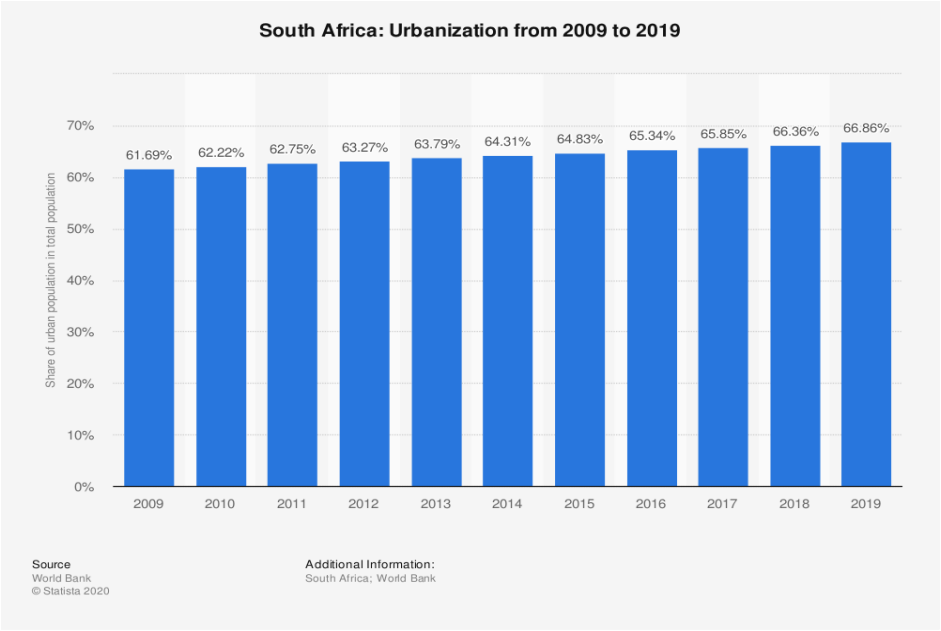
3.4.5 Write a paragraph of approximately EIGHT lines that compares the consideration of land uses between the Hoyt Sector Model and the Harris and Ullman Multiple Nuclei Model of Urban Structure. (4 x 2) (8)

(1895 – 1984)	


3.7 URBAN SETTLEMENT ISSUES
A. URBANISATION
B. ISSUES RELATED TO RAPID URBANISATION
LACK OF PLANNING
HOUSING SHORTAGES
OVERCROWDING
TRAFFIC CONGESTION
POOR SERVICE PROVISION
C. INFORMAL SETTLEMENTSS
D. ENVIRONMENTAL, ECONOMIC AND SOCIAL JUSTICE ISSUES

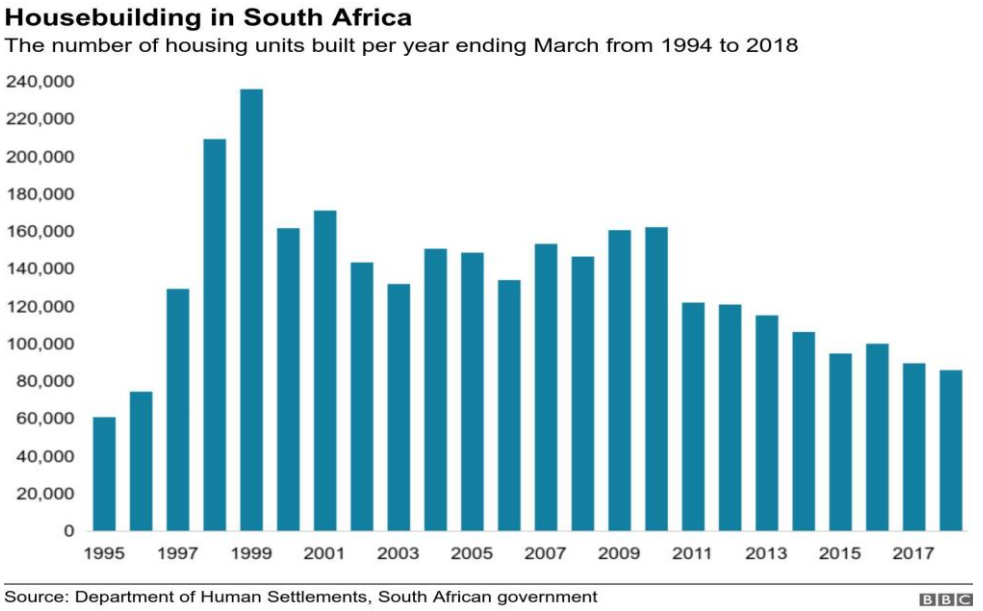
3.7 URBAN SETTLEMENT ISSUES

URBAN ISSUE - RAPID URBANISATION



In 2019, over 66 percent of South Africa's total population lived in urban areas and cities. Urbanisation defines the share of urban population from the total population of a country. Just like urbanisation, the population density within the nation has risen, reaching 46 inhabitants per square kilometre, meaning more people are sharing less space. ***Many opportunities for work and leisure can be found in the urban locations of South Africa, and as such the five largest municipalities each now have over three million residents.***

URBAN ISSUE - HOUSING SHORTAGES



Just under 580,000 homes were delivered during the first four years of the ANC's current term, 2015 to 2018. The South African government estimates a current national shortfall of 2.1 million homes - for about 12.5 million people. It has set a target of 2030 to fill that gap. But independent think-tank the Centre for Affordable Housing Finance in Africa (CAHF) ***says the backlog is massive "and annual delivery by government is clearly insufficient to meet demand". And at the current delivery rate - 136,000 homes per year - only 1.5 million of the 2.1 million currently needed would be available by 2030.***

URBAN ISSUE - OVERCROWDING



URBAN ISSUE - TRAFFIC CONGESTION



URBAN ISSUE -SERVICE PROVISION



Overcrowding in KwaZulu-Natal schools has reached alarming proportions – 670 000 pupils are being taught in classrooms of more than 55 pupils each 42 KwaZulu-Natal schools with more than 90 pupils in a classroom, 254 schools at which the classroom average was 60 pupils, and 934 schools at which the average was 55	People usually experience the grind of 50 km of a crowded Johannesburg highway, the N1. Even if they work in the east or west, residents of Soweto, are sure to meet up at the usually congested Uncle Charlie's interchange. From here they will connect to the only road that can take them home the N12. If the working population of Soweto is estimated at 222 357 people who earn a monthly income between R4 800-R9 600 will spend at least 40% of their salary on travel costs.	Gauteng is the leading province in service-delivery protests, per research, accounting for more than 33% of protests recorded. The year 2017 has so far produced the third-highest number of protests, accounting for 11% of service-delivery protests since 2004. "Violent protest activity remains a concern for many South African communities, given its adverse impact on schooling, work opportunities and community safety.

ACTIVITY 3.7 A

FIGURE 3.7 A

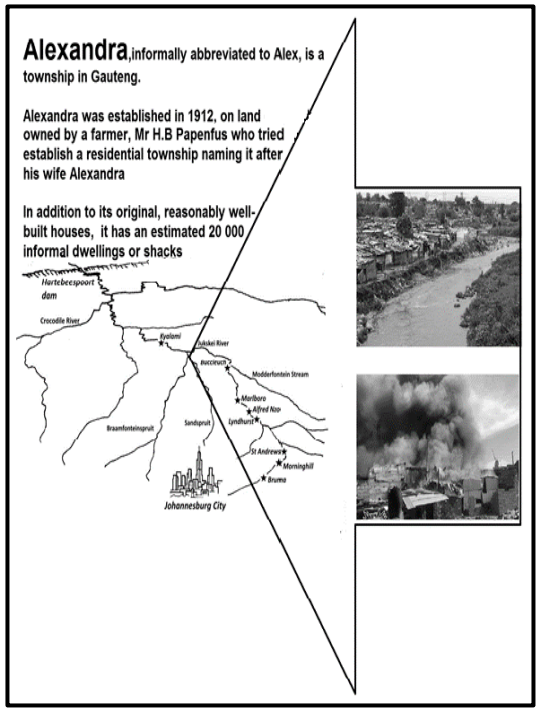


3.7.1 Why are "potholes" considered a service delivery issue. (2 x 2) (4)

3.7.2 Why is this area of service delivery neglected by municipalities. (3 x 2) (6)

ACTIVITY 3.7 B

FIGURE 3.7 B

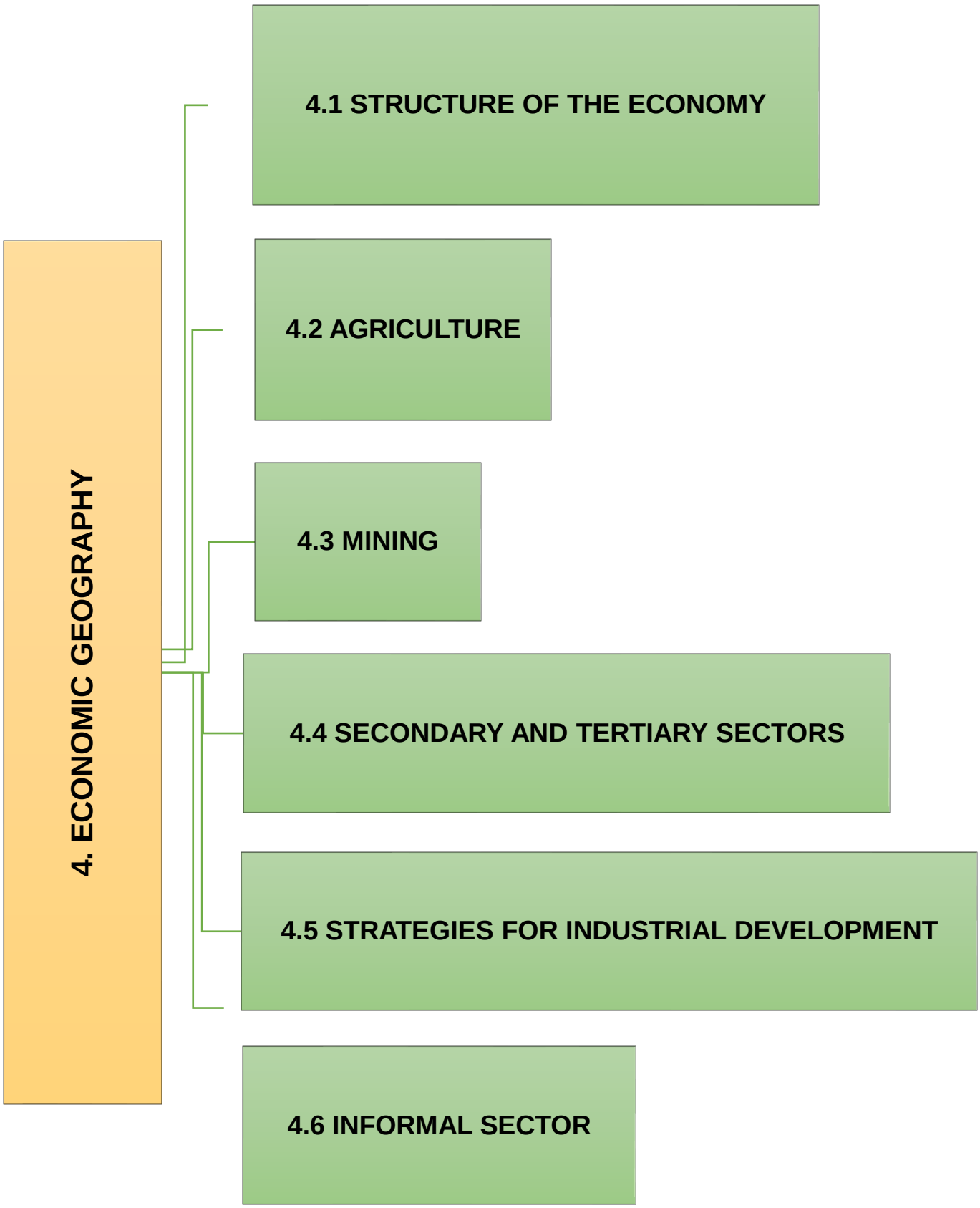


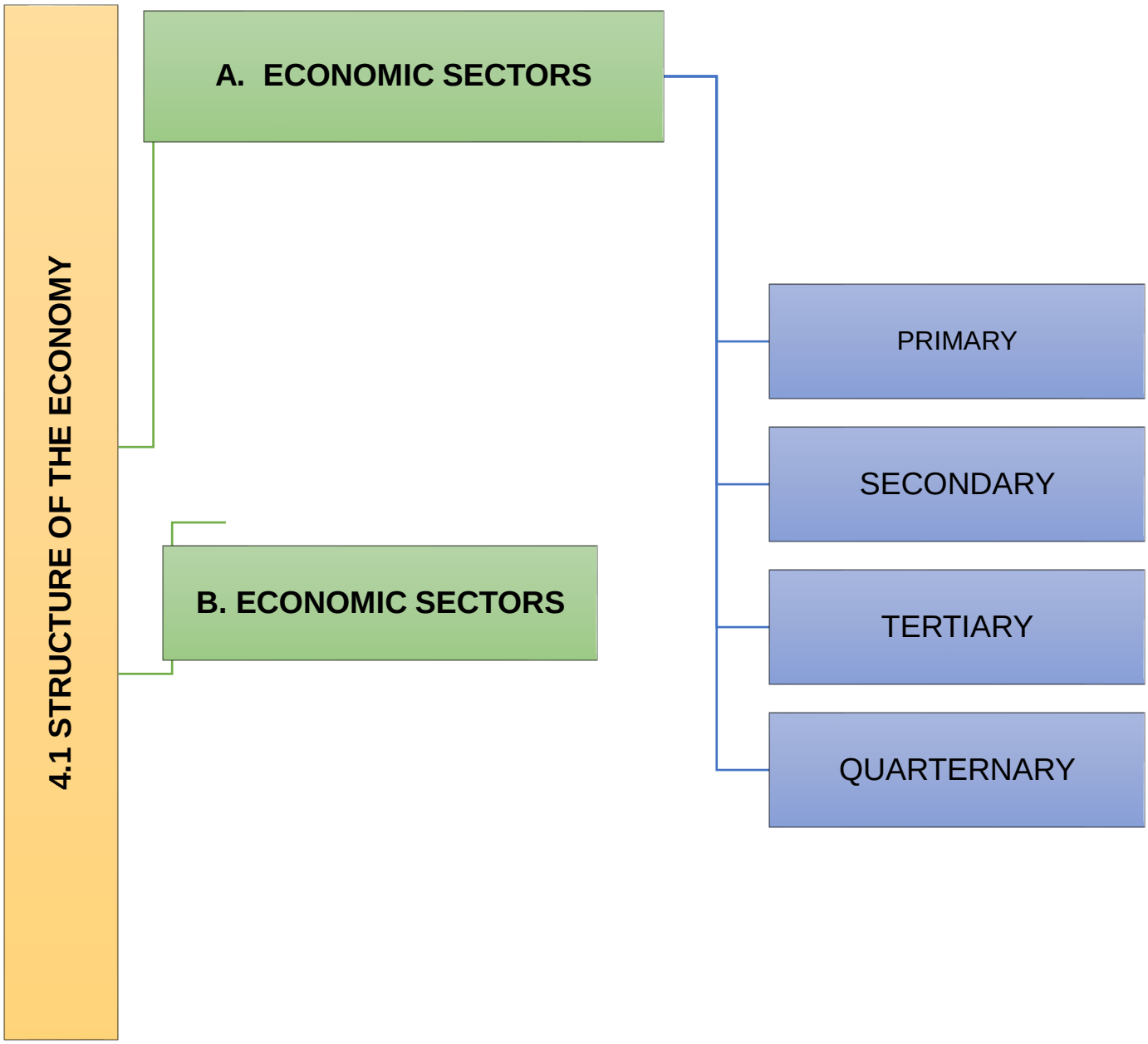
REFER TO FIGURE 3.7 B

3.7.3 What is an informal settlement? (1 x 1) (1)

3.7.4 Why is Alexandra township an informal settlement? (1 x 2) (2)

3.7.5 Discuss ways in which the Gauteng (GPG) can improve the living conditions for residents in Alexandra. (3 x 2) (6)


4. ECONOMIC GEOGRAPHY
4.1 STRUCTURE OF THE ECONOMY
4.2 AGRICULTURE
4.3 MINING
4.4 SECONDARY AND TERTIARY SECTORS
4.5 STRATEGIES FOR INDUSTRIAL DEVELOPMENT
4.6 INFORMAL SECTOR


4.1 STRUCTURE OF THE ECONOMY
A. ECONOMIC SECTORS
B. ECONOMIC SECTORS
PRIMARY
SECONDARY
TERTIARY
QUARTERNARY

4.1 STRUCTURE OF THE ECONOMY

A. ECONOMIC SECTORS (PRIMARY, SECONDARY, TERTIARY, QUARTERNARY)

ECONOMIC SECTORS

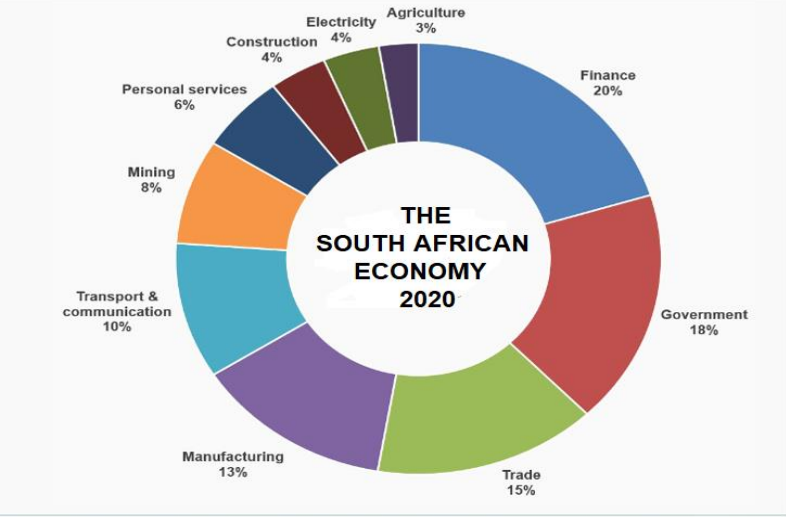
PRIMARY ACTIVITIES
Extraction(removing) and exploitation of raw materials

SECONDARY ACTIVITIES
Processing and manufacturing of primary materials

TERTIARY ACTIVITIES
Provides services to the consumer

QUARTERNARY ACTIVITIES
High level services, e.g. research, information

SOUTH AFRICA'S ECONOMIC ACTIVITIES



Primary Economic Activities

Primary Economic activities are those that extract raw materials/natural resources from the earth. Examples of Primary activities include agriculture, mining, fishing, forestry

Secondary Economic Activities

Secondary activities are those that take the raw materials produced by the primary sector and process them into manufactured goods and products. Examples of secondary activities include heavy manufacturing, light manufacturing, food processing, oil refining and energy production.

Tertiary Economic Activities

The tertiary sector is also called the service sector and involves the selling of services and skills. They can also involve selling goods and products from primary and secondary activities. Examples of tertiary employment include the health service, transportation, education, entertainment, tourism, finance, sales and retail.

Quaternary Economic Activities

The quaternary sector consists of those activities providing information services, such as computing, ICT (information and communication technologies), consultancy (offering advice to businesses) and R&D (research, particularly in scientific fields).

TERMINOLOGY ASSOCIATED WITH ECONOMIC GEOGRAPHY

KEY CONCEPTS/TERMINOLOGY:

Balance of payment: A country's financial statement showing its transactions with the rest of the world.

Balance of trade: The value of exports minus the value of imports.

Bridge industries: Industries that is located between the source of raw materials and the customer, e.g. oil refineries.

Centralisation: Movement of industries into core areas.

Decentralisation: Movement of activities away from overcentralised areas.

Economic activities: Activities that people practise to meet their needs or earn a living.

Exports: Goods and services that are sold to foreign countries.

Favourable trade balance: Occurs when the value of exports is greater than the value of imports.

Food insecurity: When not all the people have enough food to meet their needs for a healthy and productive life.

Food security: When all the people have enough food to meet their needs for a healthy and productive life.

Footloose industries: Industries that can be randomly located without being affected by factors such as resources or transport, e.g. diamond processing and computer chip manufacturing.

Foreign exchange: The money paid to South Africa by other countries, e.g. dollars and pounds, in exchange for goods and services.

Formal sector: Registered businesses that are licensed to sell goods or provide services.

Globalisation: The way in which the economic, social, political and cultural activities of countries across the world are interconnected (working together).

Gross Domestic Product (GDP): The total value of goods and services produced within the borders of the country in a year.

.

Gross National Product (GNP): The total value of goods and services produced by the permanent citizens of a country in one year (note that permanent citizens may work out of the country).

Hawker: An informal street trader.

Imports: Goods and services that are bought from foreign countries.

Industrial Development Zone (IDZ): Industrial estates or areas aimed at economic growth and new investment; used by developing countries to attract investment, create jobs and boost exports.

Informal sector: Activities by small, unregistered businesses that sell goods or provide services without being licensed, e.g. petty trade, casual employment, spaza shops and street hawkers or traders.

Infrastructure: Transport network (roads, railways) and services (electricity, telecommunication, water and sewerage) that are in place.
Primary activities: Activities that involve taking natural resources from the earth, e.g. farming (livestock, crops), forestry, mining, fishing.

Semi-skilled worker: A worker who does routine tasks (simple tasks that are done on a regular basis); someone who is not skilled or trained to do specialised work (difficult tasks that need special training).

Skilled worker: A worker who has a specific set of skills or specialised knowledge that has usually been obtained through formal training.

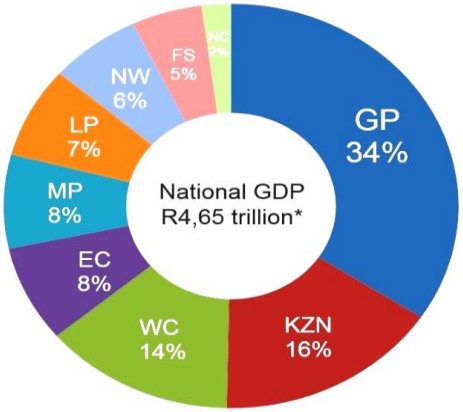
Spatial Development Initiatives (SDI): Programme aimed at improving infrastructure and attracting business investments in rural areas that were neglected and underdeveloped.

Tertiary activities: Activities that deal with the supply of services, e.g. banking, trade and transport.

Trade: The flow of goods and services from producers to consumers across the world.

B. ECONOMIC SECTORS Contribution to the SOUTH AFRICAN ECONOMY, VALUE and EMPLOYMENT
C. USE OF STATISTICAL AND GRAPHICAL INFORMATION

CONTRIBUTION TO SOUTH AFRICAN GDP PER PROVINCE



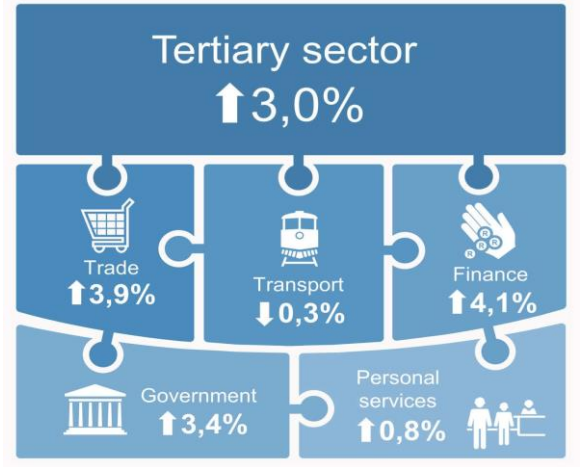
CONTRIBUTION OF THE PRIMARY SECTOR (2019)



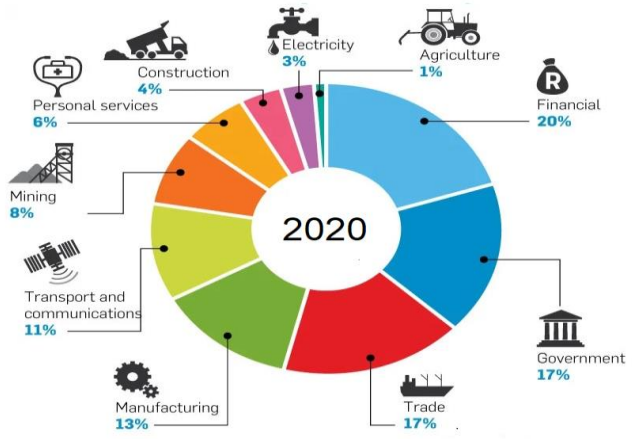
CONTRIBUTION OF THE SECONDARY SECTOR (2019)



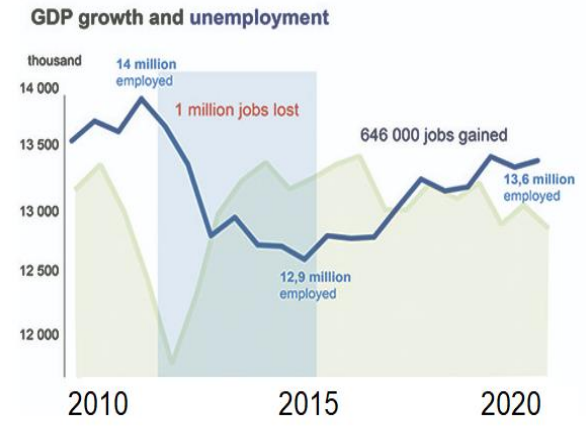
CONTRIBUTION OF THE TERTIARY SECTOR (2019)



CONTRIBUTION TO THE SOUTH AFRICAN ECONOMY BY VALUE (2019-2020)



EMPLOYMENT IN THE SOUTH AFRICAN ECONOMY (2018-2019)



ACTIVITY 4.1
REFER TO FIGURE 4.1

% change per annum									f...projected figures
	2010	2011	2012	2013	2014	2015	2016	2017	2018f
Agriculture, forestry & fishing	-0.3	1.3	0.6	1.5	5.6	-8.4	-7.6	3.4	5.4
Mining & quarrying	5.3	-0.7	-2.9	4.0	-1.6	3.0	-2.9	0.1	1.6
Manufacturing	5.9	2.9	1.9	0.7	0.0	0.1	-0.1	1.4	2.9
Electricity, gas & water	2.4	1.4	-0.1	-0.6	0.0	-1.0	-0.5	2.1	4.1
Trade, catering & accommodation	4.4	3.8	3.6	1.9	1.3	1.4	1.0	1.1	2.5
Transport, storage & communication	1.7	3.0	2.5	2.0	2.3	1.4	0.5	0.9	2.2
Finance, insurance & business services	1.2	4.1	3.0	3.0	2.2	2.8	1.9	2.0	3.6
Community, social & personal services	0.4	2.4	2.1	1.8	1.4	1.1	1.0	1.2	2.0
General government	2.7	4.5	3.6	3.1	3.0	0.9	1.1	0.6	1.0
Total GDP growth	2.9	3.0	2.2	2.3	1.6	1.2	0.4	1.2	2.6

4.1.1 Name the economic sector into which agriculture, forestry and fishing is categorised. _____

4.1.2 Which primary economic activity has shown the lowest growth rate during the period 2010 to 2015? _____

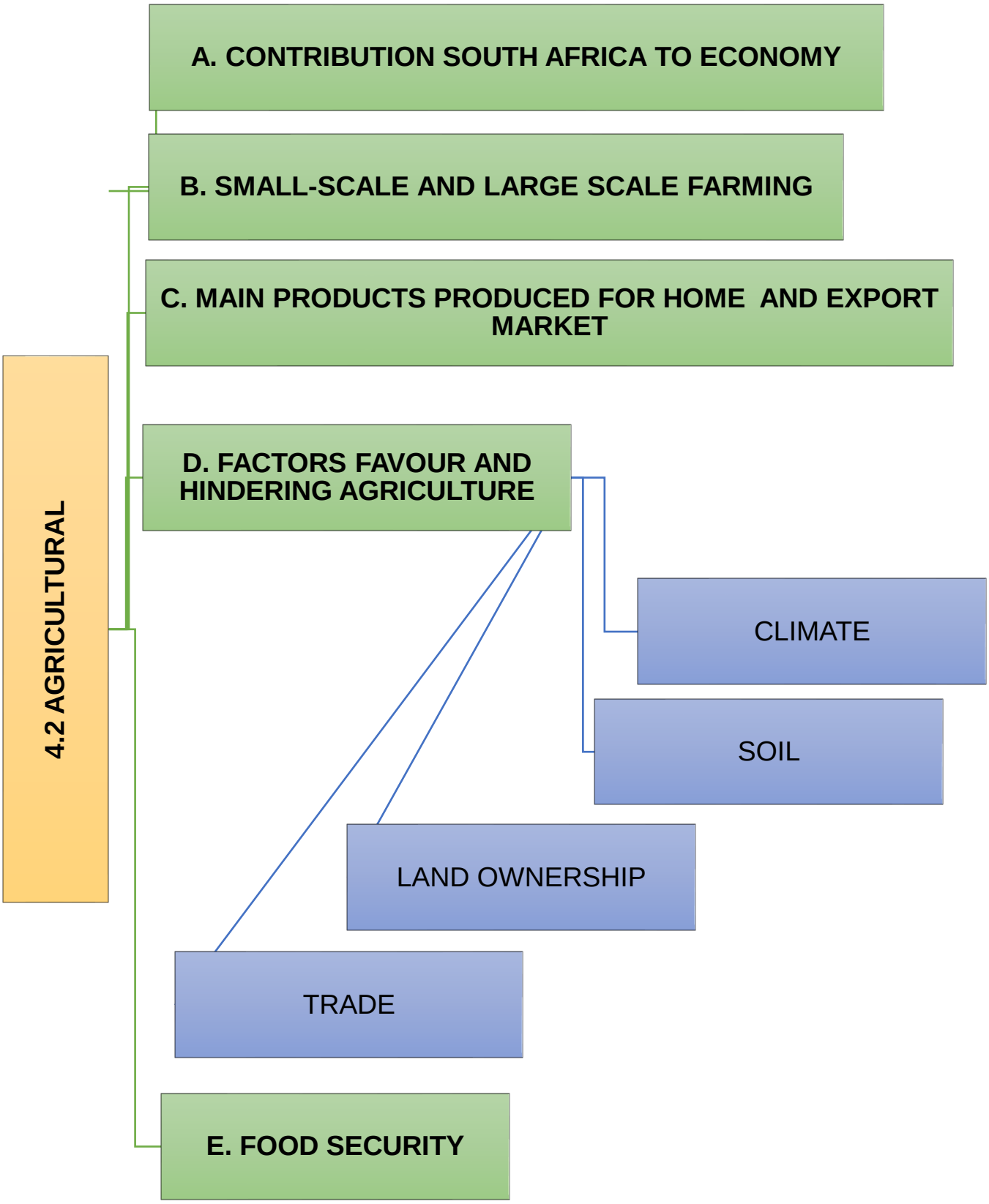
4.1.3 Which economic activity is projected to show the lowest growth rate in 2018? _____

4.1.4 Name the tertiary activity that has the highest growth rate projected for 2018. _____

4.1.5 Into which economic sector would 'general government' be classified? _____

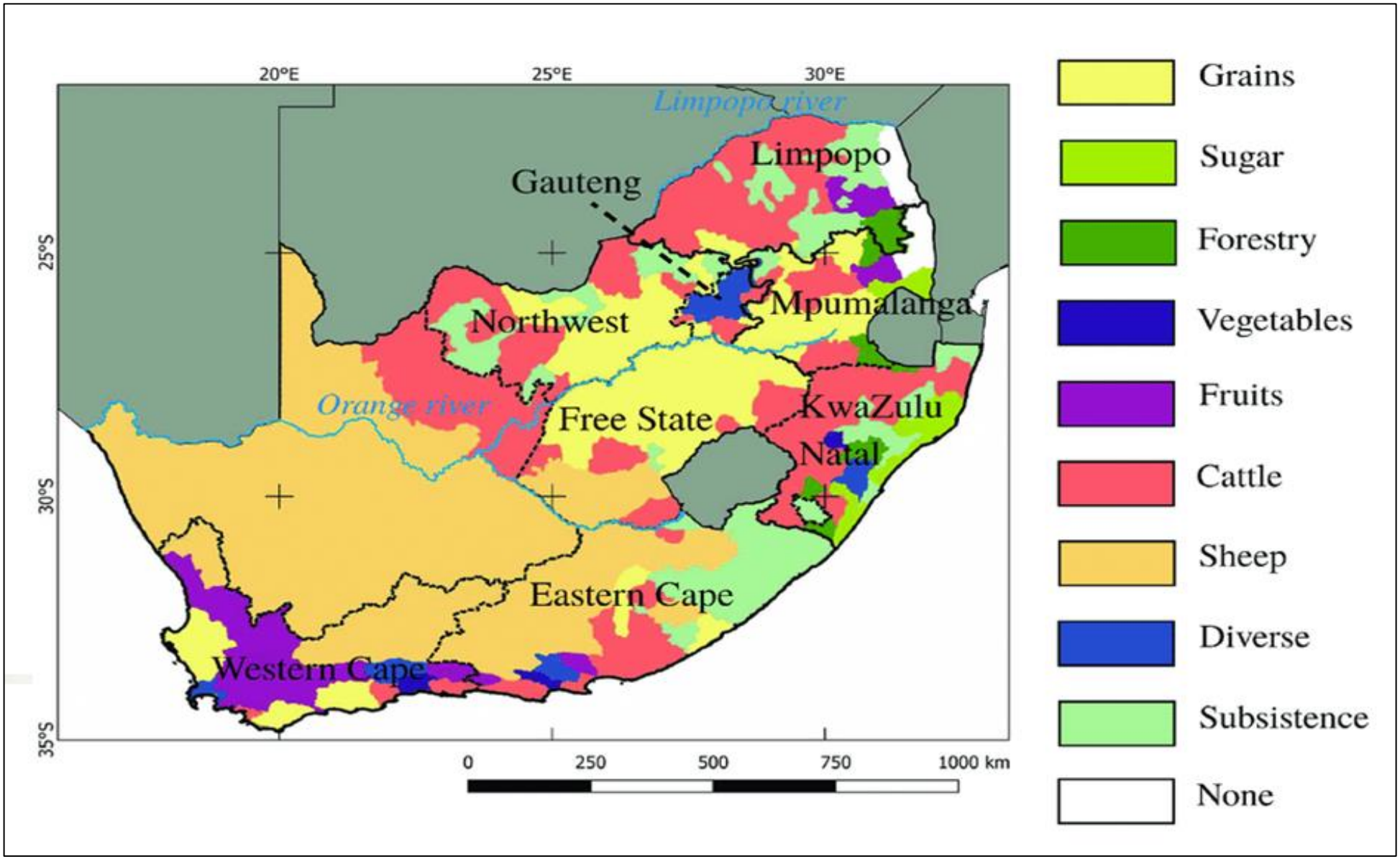
4.1.6 Which year shows the highest total GDP growth of all economic activities? _____

4.1.7 Calculate the GDP growth rate of finance, insurance and business services from 2016 to 2018. _____(7 x 1) (7)


4.2 AGRICULTURAL
A. CONTRIBUTION SOUTH AFRICA TO ECONOMY
B. SMALL-SCALE AND LARGE SCALE FARMING
C. MAIN PRODUCTS PRODUCED FOR HOME AND EXPORT MARKET
D. FACTORS FAVOUR AND HINDERING AGRICULTURE
CLIMATE
SOIL
LAND OWNERSHIP
TRADE
E. FOOD SECURITY

4.2 AGRICULTURE

A. CONTRIBUTION OF AGRICULTURE TO THE SOUTH AFRICAN ECONOMY


20°E
25°E
30°E
25°S
30°S
35°S
Limpopo river
Orange river
Limpopo
Gauteng
Northwest
Mpumalanga
Free State
KwaZulu
Natal
Eastern Cape
Western Cape
0
250
500
750
1000 km
Grains
Sugar
Forestry
Vegetables
Fruits
Cattle
Sheep
Diverse
Subsistence
None

CONTRIBUTION OF AGRICULTURE TO THE SOUTH AFRICAN ECONOMY

CONTRIBUTION OF AGRICULTURE TO THE ECONOMY:

Agriculture plays a role in job creation and or employment opportunities. It is linked with other sectors in the economy where it supplies raw materials and linked with manufacturing sector. Foreign currency earnings are evident in the sector through exports of agricultural products like wine; maize; wheat and many more.

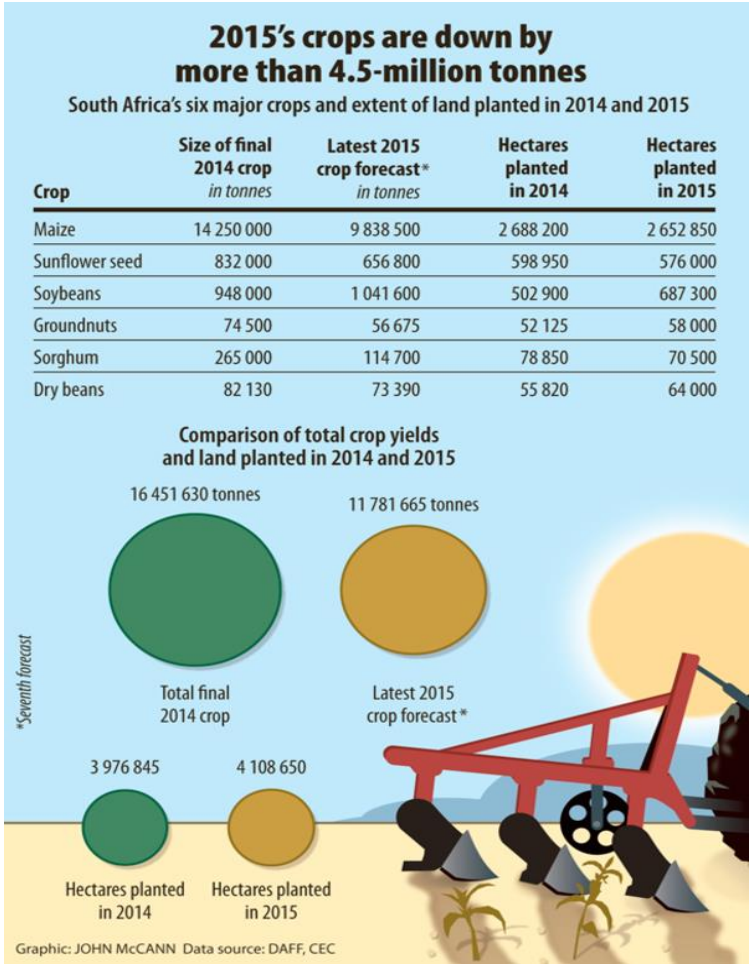
Cabinet approved an Agricultural Action Policy Plan where it was mandated to improve the revitalisation of agriculture and Agro processing value chains in priority commodities such as maize, soya beans, poultry and red meat which were identified as having high growth potential and high labour absorption capacity.

This would be able to create 1 million jobs by 2030. Land Care Programme aims to promote sustainable land and soil management practices to prevent land degradation and desertification in rural areas and contribute to job creation. Work includes reducing the spread of invasive alien plants, fencing and protecting agricultural land against degradation, conserving water resources and combating the loss of topsoil.

Expanded Public Works Programme's working for Fisheries projects that encourage communities to responsibly manage and conserve aquatic environments through cleaning of fishing harbours and conducting harbour patrols

Agriculture's GDP has decreased over the years as the sector is maturing and moving towards the secondary and tertiary sectors. The sector employs 638000 people formally although about 8.5 million are directly or indirectly dependent on agriculture for their employment and income.

MAIN PRODUCTS PRODUCED



Crop	Size of final 2014 crop *in tonnes*	Latest 2015 crop forecast* *in tonnes*	Hectares planted in 2014	Hectares planted in 2015
Maize	14 250 000	9 838 500	2 688 200	2 652 850
Sunflower seed	832 000	656 800	598 950	576 000
Soybeans	948 000	1 041 600	502 900	687 300
Groundnuts	74 500	56 675	52 125	58 000
Sorghum	265 000	114 700	78 850	70 500
Dry beans	82 130	73 390	55 820	64 000

B.THE ROLE OF SMALL-SCALE AND LARGE-SCALE FARMING

SMALL-SCALE FARMING	LARGE-SCALE FARMING
Small-scale farming is the production of crops and livestock on a **small** piece of land without using advanced and expensive technologies. This type of **farming** is usually characterised by intensive labour and in most cases, animal traction, limited use of agrochemicals and supply to the local or surrounding markets.	**Farming** that requires **large** landholdings to achieve higher levels of output and production, Large scale farming is usually characterised by the growth of **large-scale farms** that acquire additional land usually to expand their existing production area.
A SMALL-SCALE FARM 	**A LARGE-SCALE FARM** 
THE ROLE OF SMALL-SCALE FARMING In **South Africa,** there are about four million **small-scale** and mostly subsistence **farmers**. These **farms** play a critical **role** in food security. But these **farmers** also face numerous challenges: access to land and capital, secure land rights, appropriate extension and advice, increased climate variability and market access.	**THE ROLE OF LARGE-SCALE FARMING** South Africa has extensively developed agricultural land and well developed water schemes. Most of the developments of large-scale farming in South Africa include cash crops, such as maize and wheat. The role and contribution of large-scale farming is to local employment and economic growth of S.A.

C. FACTORS THAT FAVOUR AGRICULTURE &
D. FACTORS THAT HINDER AGRICULTURE IN SOUTH AFRICA

FACTORS THAT PROMOTE/FAVOUR AGRICULTURE IN SOUTH AFRICA:	FACTORS THAT HINDER/LIMIT AGRICULTURE IN SOUTH AFRICA:
PHYSICAL FACTORS PROMOTING AGRICULTURE: Climate, Interior plateau- flat, Flat relief, low lying hills, Acidic soils Sufficient water sources, Soil – deep and fertile **CLIMATIC FACTORS PROMOTING AGRICULTURE** Favourable climate (Variable climatic regions) for a variety of crops, rainfall in eastern areas, Water storage systems, Winter rainfall in the cape that supports citrus and wine farming. **ECONOMIC FACTORS PROMOTING AGRICULTURE** Land reform programmes, Open economic system in trade, Efficient transport to ensure effective trade, Good communication networks, commercial ports  *(Technology: Drones are used to monitor crop production: GIS applications- Climate, Geology, Drainage etc.)*	**PHYSICAL FACTORS THAT HINDER / LIMIT AGRICULTURE** Lack of water and lack of fertile soil in areas in the west of the country Steep escarpment, Steep undulating land in some areas alkaline soil, Lack of perennial water is some areas **CLIMATIC FACTORS THAT HINDER AGRICULTURE** Low average rainfall or insufficient rainfall, Droughts, floods, Desertification, soil degradation, increasing temperatures, increase of pest in high temperatures, Frost pockets in valleys, Lack of surplus water, Alien plants evading our soils and consuming a lot of water from underground **ECONOMIC FACTORS THAT HINDER / LIMIT AGRICULTURE** Trade barriers, Governance and corruption, Large 'gap' between rural and urban areas, Increase in cost of goods and services **SOCIAL FACTORS THAT HINDER / LIMIT AGRICULTURE** Land ownership issues and land reforms that are slow, Poor farming methods, Rural areas poor soil, no resources, Lack of capital, training, Civil conflicts that drive farmers away (Farm murders)

E.THE IMPORTANCE OF FOOD SECURITY IN SOUTH AFRICA – INFLUENCING FACTORS, and CASE STUDIES RELATED TO FOOD SECURITY

What is Food Security

Reliable access to a sufficient quantity of affordable and nutritious food.



(Food Insecurity)

Food insecurity occurs when people's access to food is minimally adequate and they have trouble meeting their basic needs, while severe inadequate access to food occurs when there is a critical lack of access to food.

What measures can be taken to improve Food Security





The involvement of households in agricultural activities for subsistence farming can play an important role in reducing the vulnerability to hunger of rural and urban food-insecure households. Most households involved in agricultural activities were involved in the production of fruits and vegetables, grain and other,



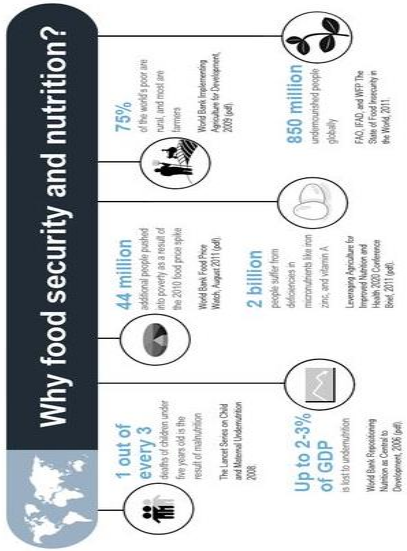
food crops, as well as in livestock and poultry farming. Although the main source of income for these households was social grants, most households involved in agricultural activities indicated that the main reason for their involvement is to supplement food for the household.

What factors affect/influence Food Security

Several factors can affect food security including **population** growth; **climate** change; urbanization and industrialization; land use shifts and water scarcity; income growth and nutritional trends; and trends in global energy supply and food trade

Where does South Africa rank regarding Food Security

Whilst South Africa is food secure at national level, the country is still food insecure at household level as not all households have access to adequate food. Almost 20% of South African households had inadequate or severe inadequate access to food in 2017. This varied by province, population group of household head and by household size.



ACTIVITY 4.2

FIGURE 4.2

More than 14 million people, or about 35% of the population in rural areas, are estimated to be vulnerable to food insecurity. Among these, women, children, and the elderly are the most vulnerable. The right to enough food is well established in international human rights documents and is also mentioned in the South African Constitution where food security is recognised as a basic human right. There is a widening gap between the rich and the poor in South Africa. High unemployment numbers mean that many households cannot meet their daily food requirements. People living in poverty cannot find the means of getting enough food either through practising small-scale farming or buying food.

[Source: http://bizcommunity.com

Read the extract from an article based on food insecurity in FIGURE 4.2.

4.2.1 Define the term *food insecurity.* (1 x 1) (1)

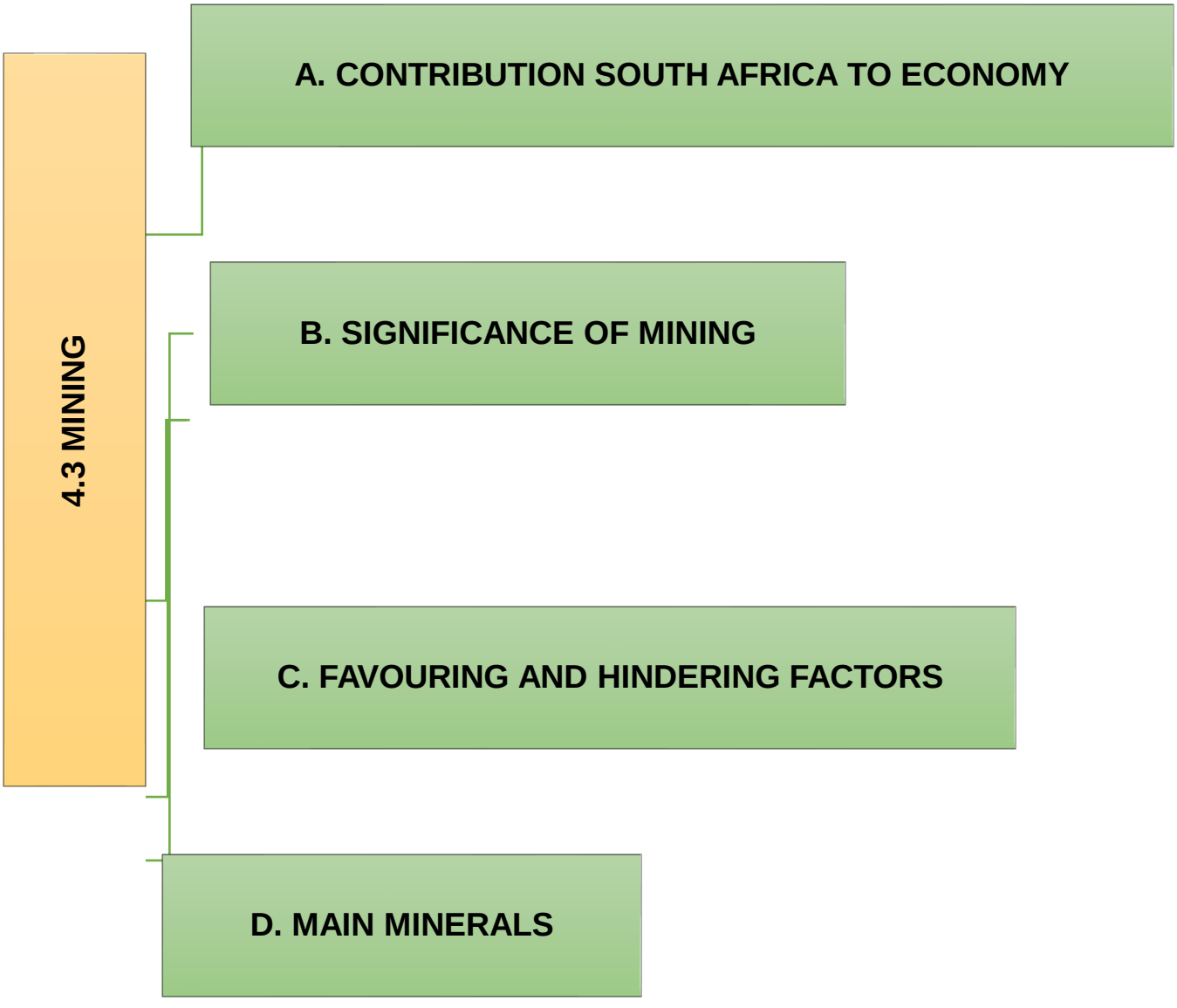
4.2.2 Name TWO groups of people, who, per the article, are most vulnerable to food insecurity in rural areas. (2 x 1) (2)

4.2.3 Name ONE physical factor that contributes to food insecurity. (1 x 2) (2)

4.2.4 Name ONE socio-economic factor that contributes to food insecurity. (1 x 2) (2)

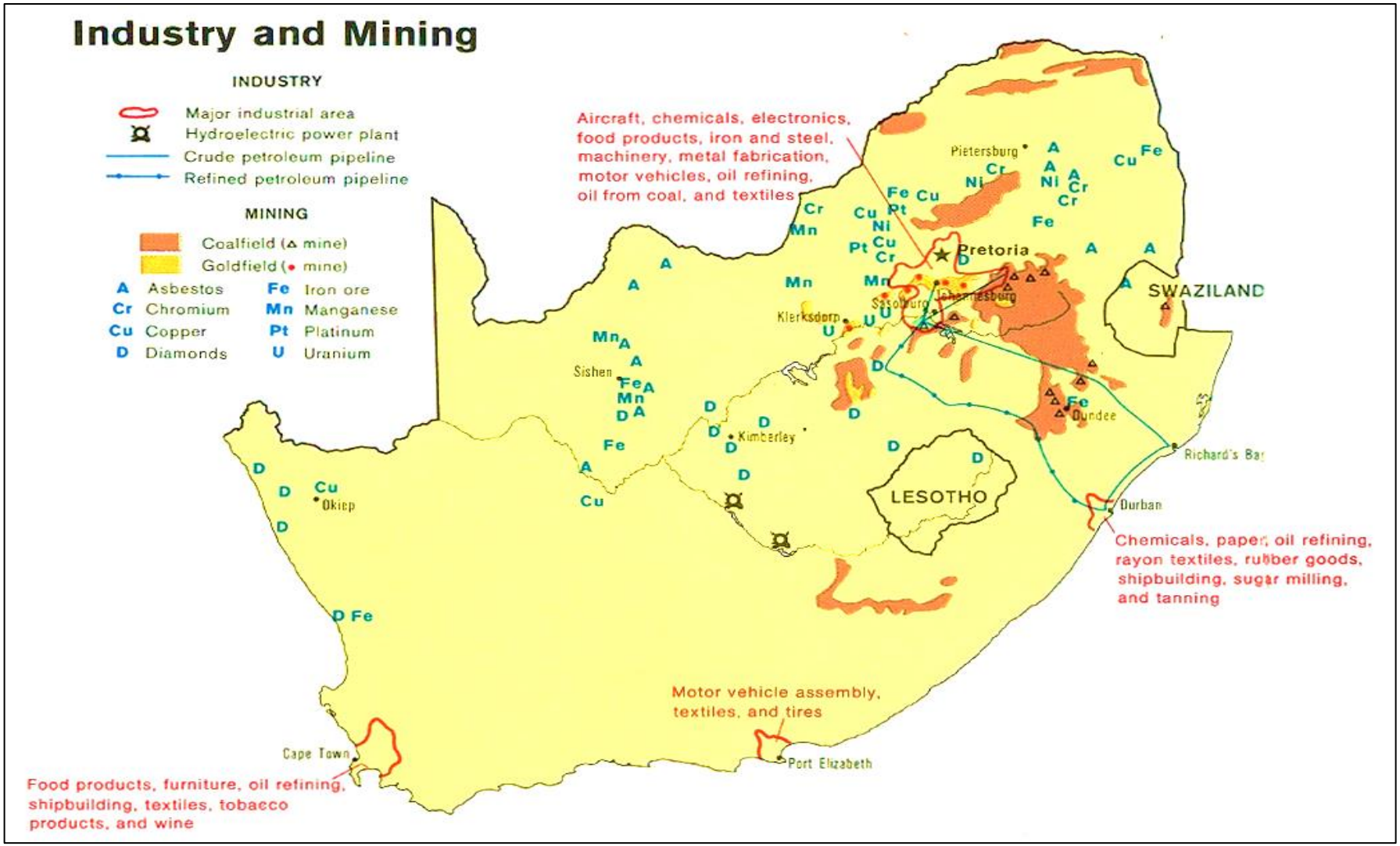
4.2.5 Write a paragraph of approximately EIGHT lines in which you suggest measures that could be put in place to ensure that South Africa is food secure. (4 x 2) (8)

_____ _____	_____ _____


4.3 MINING
A. CONTRIBUTION SOUTH AFRICA TO ECONOMY
B. SIGNIFICANCE OF MINING
C. FAVOURING AND HINDERING FACTORS
D. MAIN MINERALS

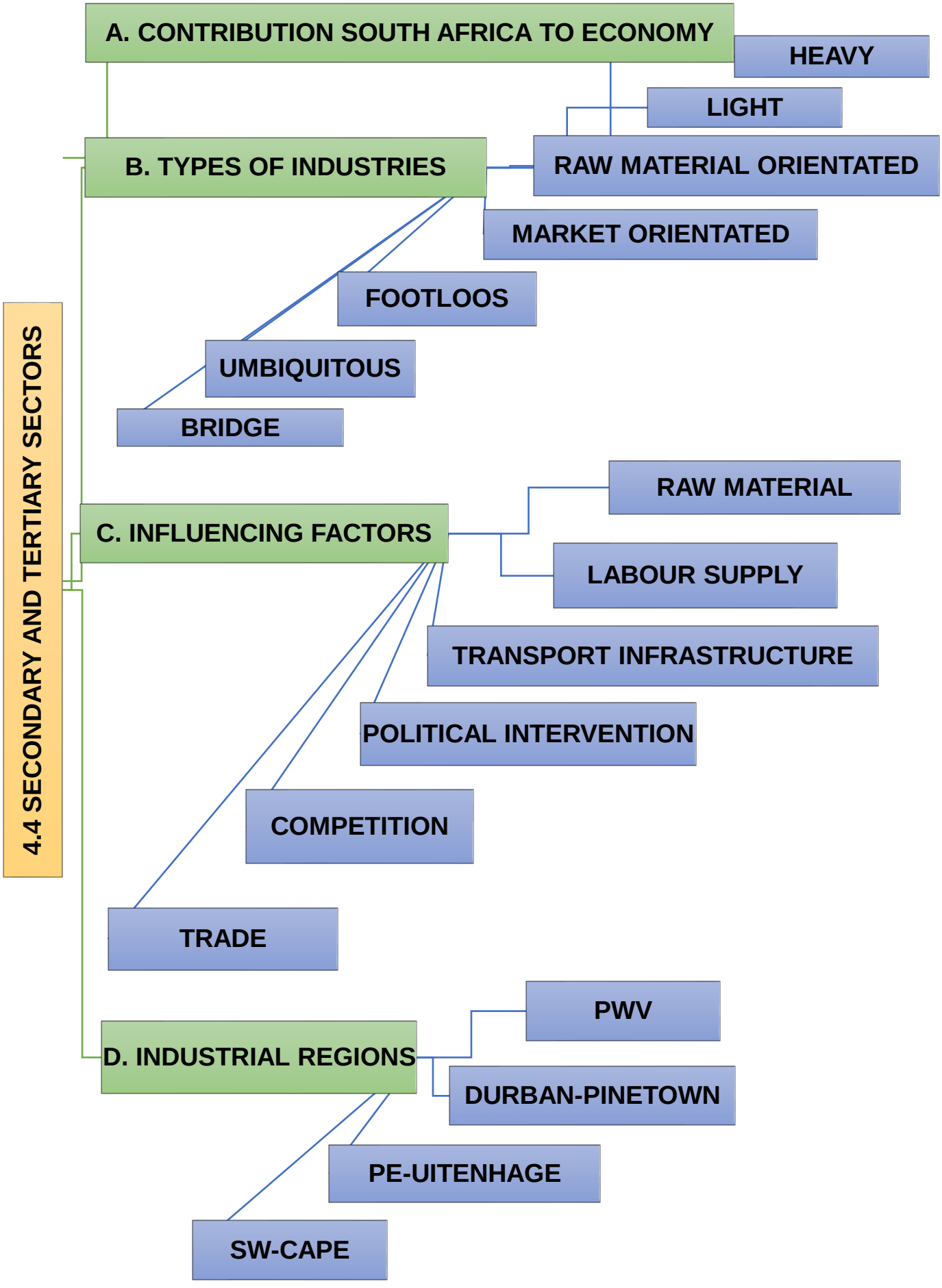
4.3 MINING

A. MINING IN THE SOUTH AFRICAN ECONOMY



C.FACTORS THAT FAVOUR AND HINDER MINING IN SOUTH AFRICA

FACTORS THAT PROMOTE/FAVOUR AGRICULTURE IN SOUTH AFRICA:	FACTORS THAT HINDER/LIMIT AGRICULTURE IN SOUTH AFRICA:
PHYSICAL FACTORS PROMOTING MINING: Minerals are close to the surface, Gauteng geothermal gradient is low, temperature does not increase rapidly underground. Coat of cooling systems is reduced, Saldana and Richards Bay harbours (commercial ports) **CLIMATIC FACTORS PROMOTING MINING:** Favourable climate, Rainfall in eastern region, Variable climatic regions **ECONOMIC FACTORS PROMOTING MINING:** Private sector, Foreign investment in mining Efficient transport to ensure effective trade Electricity supply, Taxes paid from mining, employment opportunities **SOCIAL FACTORS PROMOTING MINING:** Skilled and unskilled labour, Migrant labour, Development of towns, roads, services in mining areas Creation of jobs for SA's large labour force	**PHYSICAL FACTORS HINDERING MINING:** High temperatures making mining difficult, Costly cooling system **CLIMATIC FACTORS HINDERING MINING:** Droughts and floods, Desertification, Pollution –acid mine drainage Open cast mining- dust, destroying habitats **ECONOMIC FACTORS HINDERING MINING:** Only 15% of minerals sold locally, Dependence on foreign buyers, Cost of transportation is high as mines are situated far from the harbours, Governance and corruption, Fluctuating values of minerals, Accidents, cost to rehabilitate mining areas is high water usage **SOCIAL FACTORS HINDERING MINING:** Accidents, Migrant labour –family breakdown, High cost of training, Housing of miners, Strikes, Tribal fighting, Loss of jobs with closing of mines, Diseases- silicosis – dust, Asbestosis – asbestos


4.4 SECONDARY AND TERTIARY SECTORS
A. CONTRIBUTION SOUTH AFRICA TO ECONOMY
HEAVY
LIGHT
B. TYPES OF INDUSTRIES
RAW MATERIAL ORIENTATED
MARKET ORIENTATED
FOOTLOOS
UMBIQUITOUS
BRIDGE
C. INFLUENCING FACTORS
RAW MATERIAL
LABOUR SUPPLY
TRANSPORT INFRASTRUCTURE
POLITICAL INTERVENTION
COMPETITION
TRADE
D. INDUSTRIAL REGIONS
PWV
DURBAN-PINETOWN
PE-UITENHAGE
SW-CAPE

4.4 SECONDARY AND TERTIARY SECTORS
A and B. TYPES OF INDUSTRIES

CONCEPTS AND TERMINOLOGY

Growth Points - A growth point is a geographical area identified as a potential area for economic development and growth

Raw material orientated industry – factories that need to be set up near the raw materials it is based on. This is often if the raw material is too expensive or bulky to transport e.g. gold manufactures

Market orientated industry – these factories need to be near to the market to ensure success. These include perishables e.g. milk, meat and vegetables.

Footloose industries – these industries do not need to be either near the market or raw materials – thus it can be anywhere e.g. electronics manufacturers

Ubiquitous industries – this type of industry can occur all over e.g. industries using agricultural products can develop in any agricultural area.

Bridge industries/break of bulk industries – these industries develop at break of bulk points where different types of transport methods meet.

Industrial centralisation is when industries are concentrated in a few core areas

Industrial decentralization is the movement of industries from core areas to the periphery.

Industrial Development Zones (IDZs) are purpose-built, industrial estates to support exports

Industrial Development Zones (IDZs) are purpose-built, industrial estates to support exports

Greenfield sites are new industrial areas that are often found on the edge of the city (rural urban fringe), where property is cheap and access by road is easy. A footloose industry may well decide to occupy a Greenfield site.

A **Brownfield site** is an old industrial site that has been contaminated by pollution. The land is, therefore, cheap but activities avoid it because of the pollution. Eventually some business decides to buy the land, clean it up and use it because of its good location.

Secondary industry - Secondary industries are those that take the raw materials produced by the primary sector and process them into manufactured goods and products. Examples of secondary industries include heavy manufacturing, light manufacturing, food processing, and oil refining and energy production.

Tertiary industry - The tertiary sector is also called the service sector and involves the selling of services and skills. They can also involve selling goods and products from primary and secondary industries. Examples of tertiary employment include the health service, transportation, education, entertainment, tourism, finance, sales, and retail.

C. FACTORS INFLUENCING INDUSTRIAL DEVELOPMENT IN SOUTH AFRICA



Physical Factors: Heavy industry needs to be near raw materials such as coal, iron ore and electricity. These industries also need mass transport like railways and water transport.



Social Factors: Each manufacturing activity requires labour, both in terms of quantity and skill levels. For example, a mine requires large numbers of miners, but they need not be very skilled. A finance house may only require few personnel, but they would be highly skilled



Economic Factors: Certain industries need to be near their markets, e.g. service industries. Certain activities also require large amounts of capital input and are near large markets





Political Factors: The government has the authority to decide where to establish industries (e.g. Coega).and this is often influenced by both political gain and capital.



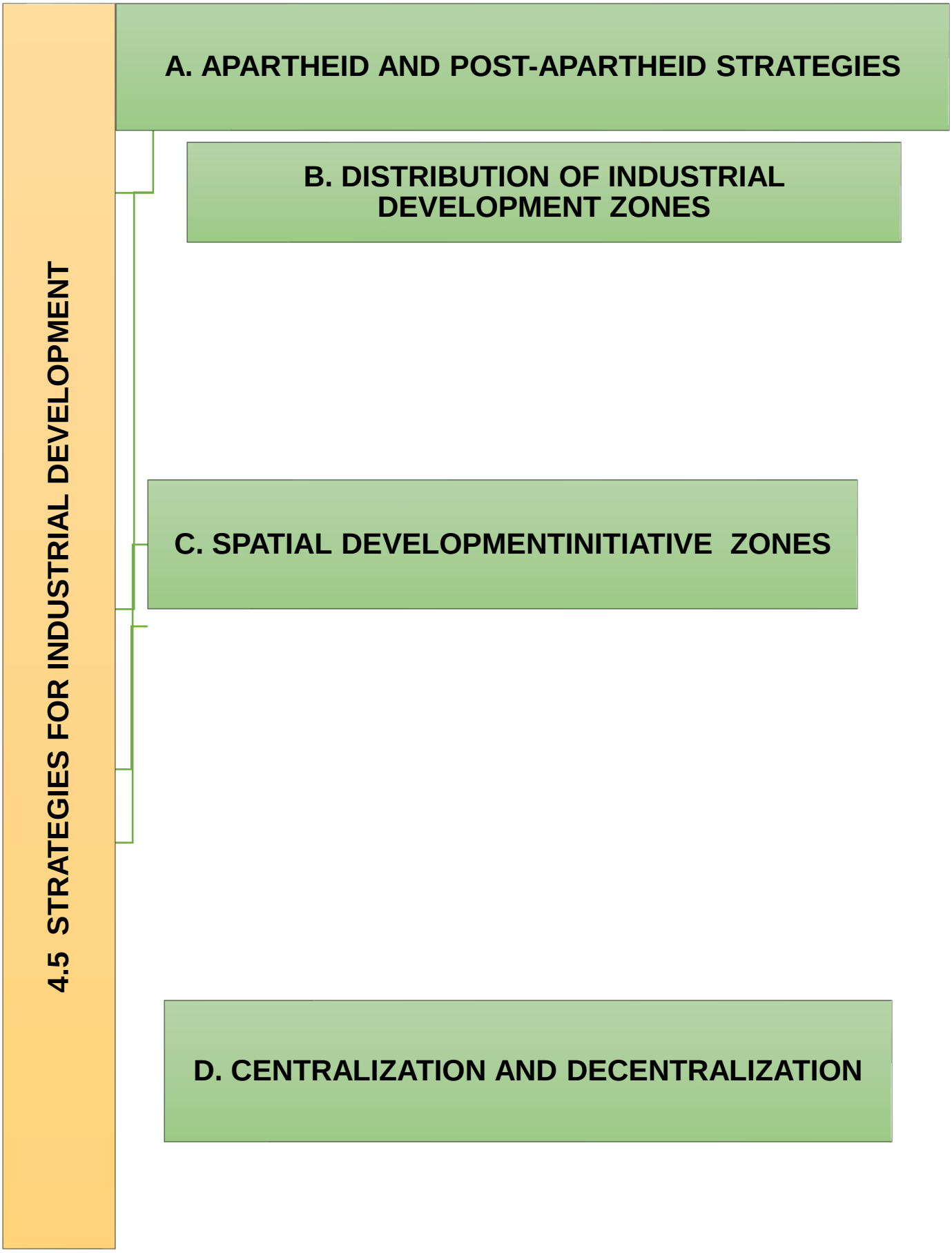
D. FACTORS PROMOTING AND HINDERING INDUSTRIAL DEVELOPMENT IN SOUTH AFRICA

FACTORS PROMOTING INDUSTRIAL DEVELOPMENT	FACTORS HINDERING INDUSTRIAL DEVELOPMENT
Raw materials – variety of agricultural, forestry and minerals in SA **Labour supply** – large unskilled, semi- skilled and skilled labour force **Water supply** – more water available in the East and water transfer schemes to supplement water in the large industrial areas **Energy supply** – Eskom supply energy form large coal deposits and large wind farms along the South coast, nuclear power in the Cape at Koeberg. Some smaller hydro electrical plants. **Transport** – well developed road, rail, harbour, and airport infrastructure **Political intervention** – incentive and rebates for industrial development and services to them. **Competition** – good quality products and lead producer in the region **Trade** – large trade with Europe, China, Germany, and rest of Africa	**Transport** – infrastructure is not well maintained and tolls, taxes and fuel is expensive **Labour supply** – expensive labour, labour unrest and lack of scares technical skills. Labour strikes are common affecting production **Water supply** – water limits industrial growth as SA is a semi-arid country – all process must be designed to use less water than in other parts of the world. **Raw materials** – are expensive and not always of good quality **Political interference** – lead to heavy taxation and restrictions which prevent foreign investment and further development. **Competition** – form cheaper imported products can destroy local industries e.g. the cheap Clothes and fabrics brought the SA textile industries to their knees. **Trade** – restrictions and taxes on imports to SA and exports to other countries lead to lower profits. Trade is often limited due to embargos and cooperation agreements between countries.

E. SOUTH AFRICA's INDUSTRIAL REGIONS

INDUSTRIAL REGION	Pretoria-Witwatersrand-Vereeniging Region (PWV)	Durban-Pinetown Region	South-Western Cape Region	Port Elizabeth-Uitenhage Region
Main Manufactured Products	Metal, iron and steel, machinery, chemicals, transport, equipment	Sugar, chemicals, paint, textiles, shipping	Wine, fresh fruit packing, dried fruit, canning, fish, clothing, food	Motor vehicle assembly plants, motor vehicle parts.
Main reason for development of region	Discovery of gold. High level of agricultural output and land. Fast growing skilled population provided market. Availability of various raw materials Water available through transfer schemes. Efficient transport network linked to major ports. High population concentration with skilled and unskilled labour	Port location High population concentration with skilled and unskilled labour. Availability of resources High rainfall for good water supply Energy – availability of coal	Tradition of specialised manufacturing skills, Inland dams provide adequate water Education above national average. Important harbour, also fast rail, and road links. Large local market and foreign tourists. High population concentration with skilled and unskilled Labour	Port location High population concentration with skilled and unskilled labour
Main factors hindering development	Water scarcity Far from harbour (ports), high transport costs	Harbour developed to capacity Hilly topography limits space	No local power source Few natural minerals Dry summers with limited water supply	Far from main consumer Areas, Labour costs higher than Asia and Eastern Europe for car production Labour unrest and strikes

				No local power source, few natural minerals Dry summers with limited water supply


4.5 STRATEGIES FOR INDUSTRIAL DEVELOPMENT
A. APARTHEID AND POST-APARTHEID STRATEGIES
B. DISTRIBUTION OF INDUSTRIAL DEVELOPMENT ZONES
C. SPATIAL DEVELOPMENTINITIATIVE ZONES
D. CENTRALIZATION AND DECENTRALIZATION

A. OVERVIEW OF APARTHEID AND POST APARTHEID INDUSTRIAL DEVELOPMENT STRATEGIES

THE RDP (1994)

Aim was to address the inequalities created by the apartheid industrial development strategies through social, economic, and political development of less developed areas.

The Reconstruction and Development Programme (RDP) (post-apartheid)

This plan was put in place shortly after 1994 and the aim was to improve the living conditions of the poor in South Africa and ensure that the basic needs of all people are met.

Aims of the RDP Plan

Housing: Between 1994 and the start of 2001 over 1.1 million cheap houses eligible for government subsidies had been built, accommodating 5 million of the estimated 12.5 million South Africans without proper housing.

Clean water: By the beginning of 1998, standpipes had been installed within 200 metres of the dwellings of about 1.3 million rural people. By August 1998 more than 2.5 million people had been given access to fresh safe water. By 2000, a total of 236 projects had supplied clean piped water to nearly 4.9 million people -- most of whom were inhabitants of former homelands**.**

Electrification: Between 1994 and May 2000 around 1.75 million homes had been connected to the national grid, while the proportion of rural homes with electricity grew from 12% to 42%.

Land reform: By 1999 some 39,000 families had been settled on 3,550 square kilometres of land. Authorities claimed that 250,000 people had 'received land' within four years.

Healthcare: Between April 1994 and the end of 1998, around 500 new clinics gave an additional 5 million people access to primary health care facilities. Under the polio-hepatitis vaccination programme that began in 1998, 8 million children were immunised within two years.

Public works: A community-based Public Works Programme provided employment over five years to 240,000 people on roadbuilding schemes and the installation of sewage, sanitation facilities and water supplies.

GROWTH, EMPLOYMENT AND REDISTRIBUTION (GEAR)

The growth, employment and redistribution plan was based on RDP plan. It focuses on making sure people were given jobs, housing, and clean water.

The plan also focuses on developing trade, investment, and private enterprise. The aim of the plan is to Develop the infrastructure and create 400 000 new jobs per year in formal sector
Increase gross domestic savings up to 12% and reduce inflation and disparities in income and liberalise the market. The Gear Plan hoped to privatise many state run organisations

B. SPATIAL DEVELOPMENT INITIATIVES

SPATIAL DEVELOPMENT INITIATIVES (SDI)

SDI's are transport and communication links between major industrial areas, metropolitan area and harbours. The idea behind this is that smaller towns along the road, rail and other transport links also benefit from the development of infrastructure and passing traffic. It makes these areas more accessible for tourists and open transport routes from the smaller settlements to services rendered in larger settlements. The local communities can also use the services like the harbours to import or export goods.

CURRENT LIST OF SDIs

The Lubombo SDI,
The West Coast SDI
The Fish River SDI (includes the coastal cities of Port Elizabeth and East London)
The Maputo Corridor (spans Gauteng and Mozambique, includes the transport infrastructure, investments in industry, agriculture and tourism)
The Wild Coast SDI (a 280 kilometre stretch of stunningly beautiful Indian Ocean coastline in South Africa's Eastern Cape province)
The Platinum SDI (includes South Africa (northern Gauteng province and North-West Province) and Botswana (the town of Lobatse)
Phalaborwa SDI (create better access between the Port of Maputo and mining potential in and around Phalaborwa and the agricultural projects near Xenon in South Africa's Northern Province)
The Richard's Bay-Empangeni SDI (the Richards Bay-Empangeni area in northern KwaZulu/Natal) (SDI 2000).

AIMS OF SDI

To improve internal trade for export Transportation networks, improve accessibility for trade between SDIs

Movement of raw materials by road and rail Movement of finished goods by road and rail Accessibility to markets- virtual and actual SDI`s were developed in underdeveloped areas to develop infrastructure

More people so a greater need for infrastructure Improved Technology Will attract more tourists

BENEFITS OF SDI TO LOCAL COMMUNITIES

Transportation networks improve accessibility for trade to the SDI Communication networks enable growth of the SDI through technology Generates economic growth where local communities can sell their wares

Generates employment opportunities in local community's support tourism have been united promoting more cooperation amongst them. Greater income for local communities Money generated is used to develop community projects Develop ethnic/cultural pride



C. CONCEPT AND DEVELOPMENT OF INDUSTRIAL DEVELOPMENT ZONES (IDZ`s)

INDUSTRIAL DEVELOPMENT ZONES (IDZ)

Industrial Development Zones (IDZs) are purpose-built industrial estates to support exports. They provide transport, logistics and business services tailored for export-oriented industries.

They are generally located around transport routes that have international links e.g. harbour, to promote exports

LOCATION OF IDZ

There are currently 5 operating IDZs in South Africa

Coega IDZ

Richards Bay IDZ

East London IDZ

Saldanha Bay IDZ

Dube Trade Port

THE AIMS OF IDZ

To promote growth in areas that are underdeveloped but have economic potential e.g. creation of new jobs and improved infrastructure to attract foreign investors.

To encourage increased levels of foreign direct investment in the economy. to encourage and promote international competitiveness in the country's manufacturing sector. to encourage manufacturing in areas and use of resources in those areas to produce goods instead of importing them (Beneficiation).

BENEFITS OF IDZ FOR THE ECONOMY (GDP AND GNP)

IDZs result in economic development

Industries are located more close to resources and raw materials Focus on supply-driven processes and outputs to break segregation practices of where people lived and got to work IDZs are designed to allow people to move around; create more access to jobs, labour mobility is freed, up etc.

HOW DOES GOVERNMENT ENCOURAGE INVESTMENT IN IDZ`s?

The aims will be achieved primarily through the giving of incentives to attract foreign and local investment within these zones to boost the country's economic attractiveness.

More incentives and tax benefits to encourage investment and economic growth and diversification



D. ISSUES ASSOCIATED WITH INDUSTRIAL CENTRALISATION AND DECENTRALISATION

	CENTRALISATION	DECENTRALISATION
ADVANTAGES	Share services, like transport links, communication lines and electricity	Create jobs in other areas that are not major industrial areas
	Benefit from proximity to other industries. Near to market	Cheaper land and rebates on services as government supports decentralisation
		Attracts people to stay in rural areas Near to labour force
DISADVANTAGES	Concentration of pollution Traffic congestion, slums, informal settlements	Far from markets Transport costs
	Expansive land and taxes near large settlements.	Isolated
	Distribution of wealth across the country is unequal as one region becomes more developed than the other Strain on physical infrastructure	
	Employment opportunities decrease in outlying areas	
PROMOTING INDUSTRIAL DECENTRALISATION	Offering tax rebates for industry that decentralise Providing land, buildings, and transportation cheaply	

ACTIVITY 4.5
FIGURE 4.5

Spatial Development Initiatives (SDIs) were introduced in post-apartheid South Africa.

> The SDI programme was developed by the Cabinet in 1995 to improve the functioning of government in certain regions of the country, especially in those areas where the greatest potential for growth existed. Eleven SDIs throughout South Africa were planned in the first phase: the Maputo Development Corridor, the Phalaborwa SDI, the Platinum SDI, the West Coast Investment Initiative, the Gariep SDI, the Fish River SDI, the Wild Coast SDI, the Richards Bay SDI, the Durban and Pietermaritzburg nodes, the Lubombo SDI and the Gauteng Special Economic Zones. [Source: www.rosalux.co.za]

4.5.1 What is a *spatial development initiative (SDI)*? (1 x 1) (1)

_____

4.5.2 Discuss the importance of SDIs for economic development in South Africa. (2 x 2) (4)

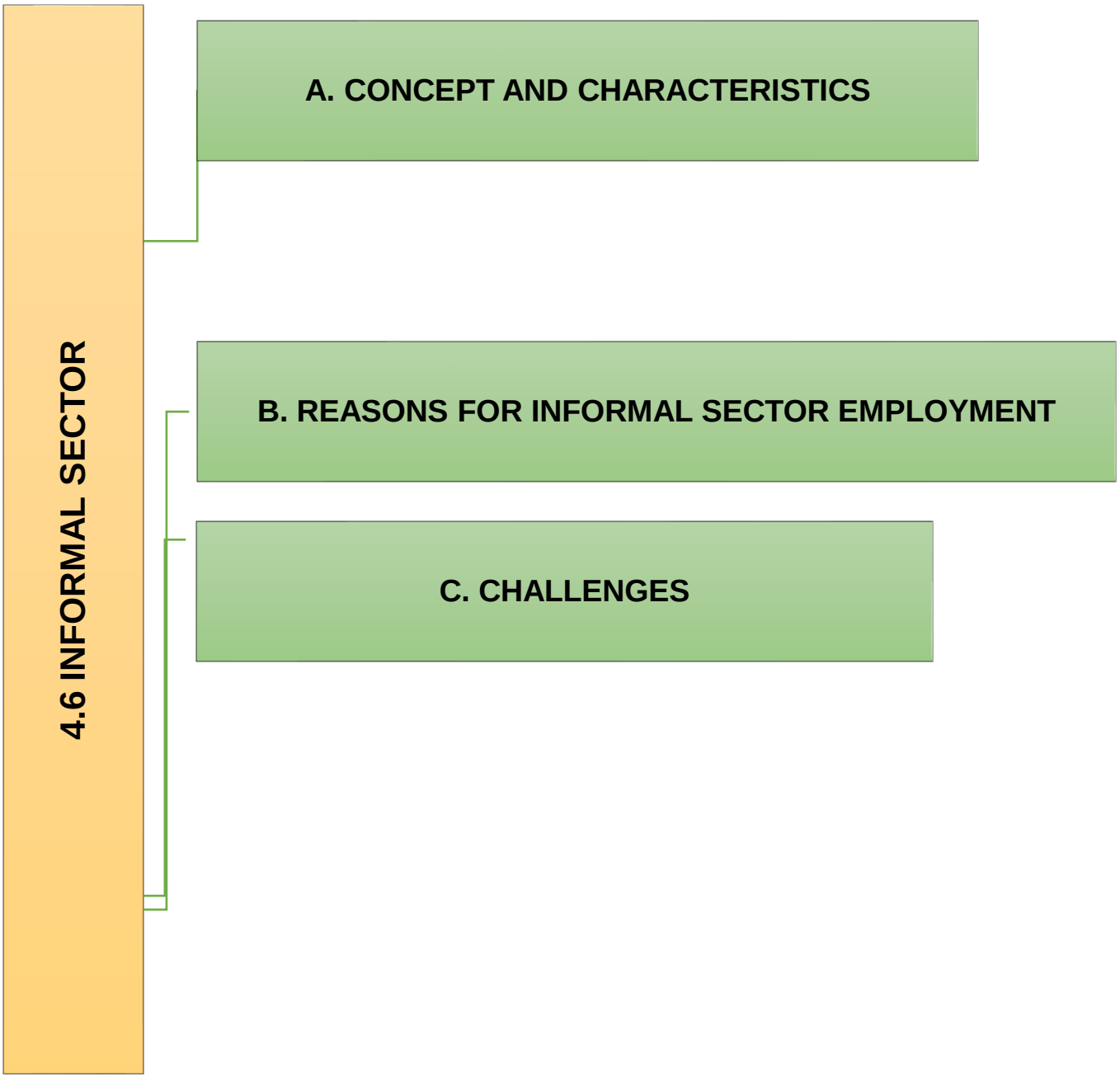
_____
_____
_____

4.5.3 Give ONE reason why the infrastructure around the newly developed SDIs needed to be upgraded. (1 x 2) (2)

_____

4.5.4 Regarding ONE SDI that you have studied, explain in a paragraph of approximately EIGHT lines how improved infrastructure supported tourism has led to the upliftment of the local community. (4 x 2) (8)

_____
_____
_____
_____
_____
_____
_____
_____
_____


4.6 INFORMAL SECTOR
A. CONCEPT AND CHARACTERISTICS
B. REASONS FOR INFORMAL SECTOR EMPLOYMENT
C. CHALLENGES

4.6 THE INFORMAL SECTOR

CONCEPT AND CHARACTERISTICS OF INFORMAL SECTOR EMPLOYMENT; REASONS FOR HIGH INFORMAL SECTOR EMPLOYMENT IN SOUTH AFRICA; CHALLENGES FACING THE INFORMAL SECTOR

CONCEPT OF INFORMAL SECTOR EMPLOYMENT:

The informal sector includes all unregistered small businesses and hawkers.

People in this sector make a living from their small business activities, but they do not pay company tax or adhere to standards or regulations.

CHARACTERISTICS OF INFORMAL SECTOR EMPLOYMENT

Not well regulated.
Do not adhere to standards for business.
Small turnover and small profit.
Convenience goods / services supplied to local community.
May include counterfeit / smuggled and illegal goods.
Not protected against harassment by law enforcement officials.
No fringe benefits e.g. pension, medical fund, housing grants etc.

REASONS FOR HIGH INFORMAL SECTOR EMPLOYMENT IN SOUTH AFRICA

Lack of skills to find other employment.
Slow economic growth – not enough jobs in the formal sector.
Poverty, people must make a living.
Rapid urbanisation.
High taxes on small businesses.
Strict business regulations

CHALLENGES FACING SOUTH AFRICA'S INFORMAL SECTOR

Illegal goods can be involved. Limited growth opportunities.
Xenophobia as many foreigners have informal businesses.
Competition can lead to violence.
Compete with formal sector and as it has lower overheads the prices are lower.
No support for obtaining loans.
No business skill development

IMPORTANCE/ROLE OF THE INFORMAL SECTOR IN THE ECONOMY

Alleviate poverty.
Make people self-sufficient.
Reduces the unemployment rate.
Less people dependant on social grants.
Some taxes are paid in the form of VAT.
Some businesses grow well and are later formalised

STRENGTHENING THE INFORMAL SECTOR

Regulating activities / premises.
Register businesses and offer training.
Allocate space for stalls that are safe and clean.
Aid with small loans to get the business going.

ACTIVITY 4.6

Informal trade is a common feature in developing countries

4.6.1 Define the term *informal sector*. (1 x 1) (1)

_____

4.6.2 State the relationship between the unemployment rate and the percentage of people working in the informal sector. (1 x 2) (2)

_____

_____

4.6.3 Why is informal trade common in developing countries? (1 x 2) (2)

_____

_____

4.6.4 How would formalising businesses impact positively on the economy? (1 x 2) (2)

_____

_____

4.6.5 Write a paragraph of approximately EIGHT lines in which you suggest ways in which informal traders can be empowered to make a meaningful contribution to the South African economy. (4 x 2) (8)

_____

_____

_____

_____

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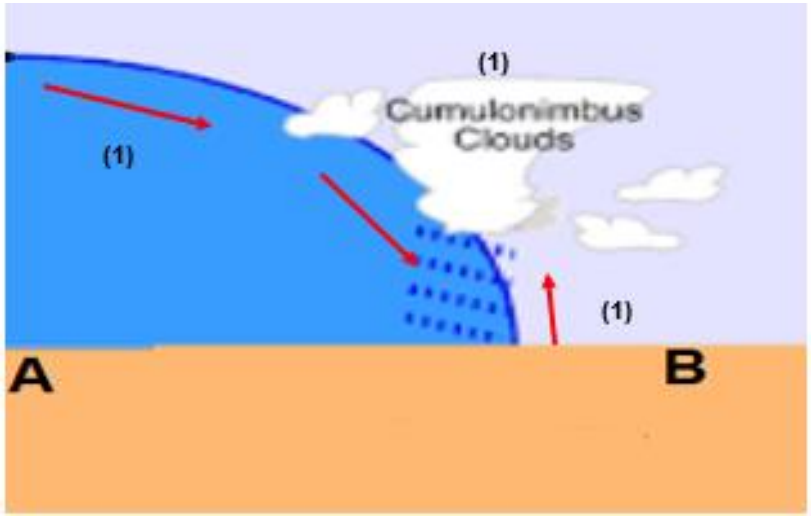
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MARKING GUIDELINE

1.1 MIDLATITUDE CYCLONE

1.1.1	Mid-latitude cyclone / Frontal depression / Temperate cyclone (1)	(1 x 1)	(1)
1.1.2	Air circulation around the low pressure is clockwise. (1) Position of cold sector – South of the warm sector (1) Bending of cold front in clockwise direction (1) [Any TWO]	(2 x 1)	(2)
1.1.3	Mature stage (1) Cold front and warm front visible (1)	(2 x 1)	(2)
1.1.4		(3 x 1)	(3)

1.1.5 **Positive effects:**
Rainfall will bring green pastures – aesthetic value. (2)
Improve farming conditions therefore more food production / variety of food available for tourists (2)
Improved farming conditions result in food prices being lowered for tourists (2)
Negative effects:
Can cause floods due to high rainfall and discourage tourists. (2)
Floods will limit tourists sightseeing. (2)
Rock falls caused by strong winds affect tourists (2)
Precipitation could make sightseeing tours dangerous for tourists. (2)
Slippery rocks can be dangerous. (2)
[Any FOUR – must include positive and negative effects.] (4 x 2) (8)

1.2 TROPICAL CYCLONES

1.2.1 Southern hemisphere (1) (1 x 1) (1)

1.2.2 The name tropical cyclone (1)
The air circulation around the system is clockwise (1) (2 x 1) (2)

1.2.3 Temperature above 26.5°C/High temperature (1)
Upper air divergence must take place (1)
Unstable air (1)
Little surface friction (1)
High Humidity (1)
Light variable winds (1)
Little surface friction (1)
Low air pressure with closed isobars (1)
[ANY ONE] (1 x 1) (1)

1.2.4 The eye (1) (1 x 1) (1)

1.2.5 The temperature does not fall to dew point so there is no cloud cover. (1 x 2) (2)

1.2.6 Developing countries do not have sufficient funds to cater fully for the needs of their people after this system occurs (2)
Their medical facilities are not sufficient to cater for all people affected (2)
Poor transport networks create difficulty to get to people in need (2)
The per capita income of the people in developing countries is low and people find it difficult to recover from the devastation (2)
Poor quality of housing/informal settlements leave people homeless (2)
[ANY FOUR Accept other reasonable answers] (4 x 2) (8)

1.3 ANTICYCLONES

1.3.1 A (1) (1 x 1) (1)

1.3.2 The inversion layer is well below the plateau/escarpment (1)
Presence of a high pressure over the plateau (1)
Strong subsidence of air which indicates cold conditions (1)
Moist air from the ocean is being prevented from moving inland (1)
[ANY ONE] (1 x 1) (1)

1.3.3 A stronger subsiding cold air mass (from the Kalahari HP) descends onto a weaker (warm) air mass creating an inversion layer (2) (1 x 2) (2)

1.3.4 There are stronger convection currents reducing the subsidence of cooler air (2)
It is higher than the plateau during summer months because the interior experiences higher temperatures (2)
Weak descending cold air mass thus not pushed very far down (2)
Kalahari High Pressure Cell not well developed in summer (2) [ANY TWO] (2 x 2) (4)

1.3.5 Summer
Additional warm moist air is drawn in from the coastal area (2)
Rising moist air results in unstable conditions (2)
Rising moist air results in cloud formation over the interior (2)
Rising moist air results in more rainfall occurring over the interior (2)
Drop in pressure over land as warm air rises (2)
Moisture front develops over interior (2)

Line thunderstorms develop over eastern interior (2)
Winter
Warm moist air blocked off from reaching the interior (2)
Lack of rising moist air results in stable conditions (2)
Lack of rising moist air reduces cloud cover over the interior (2)
Lack of rising warm air results in no/little rainfall over the interior (2)
Fewer clouds may result in the development of frost (2)
Increase in pressure as interior is dominated by subsiding air (2)
Large temperature range because of low temperatures at night and higher temperatures during the day (2)
[ANY FOUR – must refer to both summer and winter conditions] (4 x 2) (8)

1.4 VALLEY CLIMATE

1.4.1 Katabatic wind (1) (1 x 1) (1)

1.4.2 Air temperature increases with height/temperature inversion (1) The highest temperature is found mid-slope (1) Air temperature is warmer (1) Temperature is above freezing (1) [ANY ONE] (1 x 1) (1)

1.4.3 (Temperature) inversion/Valley inversion/Negative lapse rate (1) (1 x 1) (1)

1.4.4 Air temperatures are much lower (2) Air is heavier and denser (2) Increased intensity of downward movement of air/Cold air moves down the slope quickly (2) [ANY TWO] (2 x 2) (4)

1.4.5 Collection of cold, dense air at the bottom of the valley (2) Warm air is displaced from the valley floor (2)
Frost forms on the valley floor (2)
Gravity causes cold air to drain towards the valley floor (2)
Dew point temperature below freezing point (2)
[ANY TWO] (2 x 2) (4)

1.4.6 Only frost resistant crops can be planted here/Grow fruit with thick resistant skin, e.g. citrus (2)
Genetically modified seeds adapted for frost conditions (2)
Torches and fire drums (heating systems) to keep air circulating so that temperatures do not drop below 0 °C/anti-frost heating to protect crops (2)
Fans to keep air circulating (2) Mechanisms to divert subsiding wind (diversion walls) away from crops (2)

Straw in between crops to reduce terrestrial radiation (mulching) (2)
Glass houses (greenhouses) can be built to create an artificial micro-climate for sensitive crops (2)
Cover plants with frost covers (2)
[ANY TWO] (2 x 2) (4)

1.5 URBAN CLIMATE

1.5.1 B (1) (1 x 1) (1)

1.5.2 Higher temperature over the urban city (2) can accommodate more water vapour (2) and results in more evaporation.
(Any ONE) (1 x 2) (2)

1.5.3 There are more condensation nuclei in urban areas resulting in more clouds and frequent rainfall (2) (1 x 2) (2)

1,5,4 Heat trapped between the buildings due to high building density (2)
Tall buildings cause the sun's rays to be reflected and deflected between the buildings (multiple reflection) (2)
A larger surface area to absorb the sun's heat (2)
[ANY ONE] (1 x 2) (2)

1.5.5 ARTIFICIAL SURFACES
Concrete and metals are used in the construction of buildings therefore more heat is retained (2)
Tarred roads are a greater absorber of heat (2)
Glass and mirror surfaces of modern building leads to multiple reflection of heat raising the temperature (2)

URBAN ACTIVITIES
Urban areas have more heat generating activities such as restaurants (2) Light industries that produce heat (2)
Vehicles increase the production of pollutants that absorb and retain heat for longer (2)
Building activities generate heat (2) (4 x 2) (8)
[ANY FOUR - MUST REFER TO BOTH ARTIFICIAL SURFACES AND URBAN ACTIVITIES]

2.1 DRAINAGE BASIN

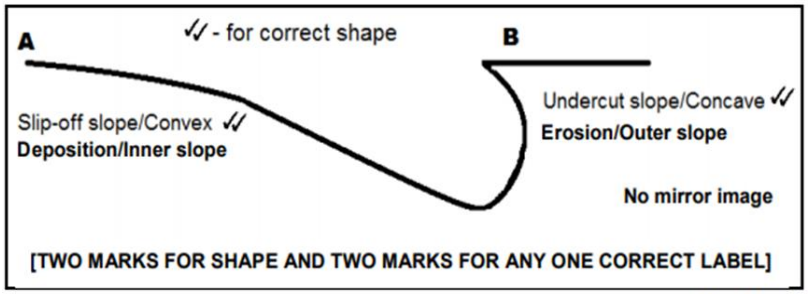
2.1.1 An area drained by a river and its tributaries (1) [CONCEPT] (1 x 1) (1)

2.1.2	A (1)		(1 x 1)	(1)
2.1.3	More direct run-off (2) Heavy rainfall (2) Steep slopes (2) Sparse vegetation (2) Impermeable underlying rock/non-porous rock (2) Saturated soil (2) [ANY ONE]		(1 x 2)	(2)
2.1.4	3rd order (2)		(1 x 2)	(2)
2.1.5	(a)	The lower the order, the shorter the streams (2) OR The higher the order, the longer the streams (2)	(1 x 2)	(2)
	(b)	The lower the order, the more the number of streams of that order (2) OR The higher the order the fewer the number of streams of that order (2) OR A river that has more/many streams has a higher stream order (2)	(1 x 2)	(2)
2.1.6	In A all the first order/fingertip streams will dry up during a drought (2) This will change the stream order at Y to a lower value (2)		(2 x 2)	(4)

2.2 FLUVIAL PROCESSES

2.2.1	Meandering (1)	(1 x 1)	(1)
2.2.2	Lower/Plain/Middle (1)	(1 x 1)	(1)
2.2.3	Gradient is gentler (2) Reduced energy/velocity (2)	(1 x 2)	(2)

2.2.4



No mirror image
Erosion/Outer slope Deposition/Inner slope
[TWO MARKS FOR SHAPE AND TWO MARKS FOR ANY ONE CORRECT LABEL]

(2 x 2) (4)

1.6.5 **SLOPE A** – MOST SUITABLE FOR THE CAMPSITE
Has a gentle convex shape (2)
Gentle slope ideal for building and camping (2)
Easy access to river for fishing or collecting water (2)
Flow rate is lower and therefore safer (2)
Over time deposition will allow the campsite to increase in size (2)
Easier to launch small boats and canoes (2)
It creates a shallow point to access the river (2)
Soil is fertile therefore more vegetation (2)
More trees for shade (2)
SLOPE B
Constant erosion/undercutting results in concave/steep slope (2)
Undercutting leads to the formation of a river cliff which is unstable (2)
The position of camp sites will retreat and cause facilities to be damaged (2)
Reduced access to water (2)
Faster flowing water will be more dangerous (2)
[ANY FOUR] (4 x 2) (8)

2.3 RIVER MANAGEMENT

2.6.1 A catchment area is the entire drainage basin of a river from where it receives water (1) [CONCEPT]
(1 x 1) (1)

2.6.2 65% of South Africa receives less than 500 mm average annual rainfall (2)
(1 x 2) (2)

2.6.3 Removal of natural vegetation (2)
Desertification (2)
Monoculture/Poor farming techniques (2)
Over-utilisation of water (2)
Livestock farming in catchment areas destroys the vegetation (2)
Veld fires (destroy vegetation which increases erosion) (2)
Removal of water from upper reaches for the purposes of water transfer (2)
Location of industries on river banks (2)
Mining activities impact on groundwater (2) [ANY ONE] (1 x 2) (2)

2.6.4 Wetlands must be conserved and restored (2) Legislation is necessary to control what is discharged into the rivers (2) Fines for dumping into and littering of rivers (2) Clearing of vegetation and planting of alien trees must be controlled (2) Construction and settlement on the floodplain must be avoided (2) Afforestation to reduce run-off and erosion (2) Constant testing to monitor the state of the river (2) Buffering of rivers (2) Conserve natural vegetation along rivers (2) Awareness campaigns (2)
[ANY TWO] (2 x 2) (4)

2.6.5 Water shortages (2) Polluted water Increases exposure to health hazards (2) Price of water will increase (2) Production costs will increase (2) Food production will decrease/Low agricultural yield (2) Food prices will increase (2) Less area to grow crops (2) Reduced quality of water due to increased pollution (2) Decreases biodiversity (2) Increases risk of flooding (2) Negative impact on rivers for recreation/tourism (2)
[ANY THREE] (3 x 2) (6)

3.1 RURAL SETTLEMENTS - PATTERNS

3.1.1	Dispersed (1)	(1 x 1)	(1)
3.1.2	The dwellings/buildings are spread out (1)	(1 x 1)	(1)
3.1.3	Farming/Cultivation of crops (1)	(1 x 1)	(1)
3.1.4	Flat land (2) Access to water from the river (2)	(2 x 2)	(4)
3.1.5	**ECONOMY** Loss of crop yields reduces profits (2) Increase in soil erosion (2) Decline in food production reduces food security of community (2) Increases unemployment of farm workers on commercial farms (2) Creates uneconomical farm units (2) **RURAL DEPOPULATION** Increase in rural depopulation (2) Farm workers cannot sustain themselves and are forced to leave (2) Creates abandoned farms (2) Increases rural-urban migration (2) [ANY FOUR]	(4 x 2)	(8)

RURAL SETTLEMENTS - SHAPES

3.2.1	Round (1)	(1 x 1)	(1)
3.2.2.	Privacy of farming ideas on farming methods (2) Farming implements are utilised and can often be damaged (2) Communal growth of culture and tradition means individual beliefs and methods are not practiced (2) [ANY TWO]	(2 x 2)	(4)

3.2.3	Share ideas and farming method (2) Safety and security of farms is improved (2) Shared growth and profits (2) Communal growth (2) [ANY ONE]	(1 x 2)	(2)
3.2.4	Improve education systems to create awareness of agriculture and development (2) Improve access to basic amenities (water and electricity) (2) Improve access to profits and sharing of farming implements (2) Create incentives for higher crop yields (2) Improve living conditions (2) Improve infrastructure to provide better access to services (2) [ANY FOUR]	(4 x 2)	(8)

RURAL – URBAN MIGRATION

3.3.1	The movement of people from the rural area to the urban area (1)	(1 x 1)	(1)
3.3.2	More people are employed in the town (2) Distances to urban centres is longer so reduces travelling costs (2) [ANY ONE]	(1 x 2)	(2)
3.3.3	PEOPLE Less social interaction increase boredom (2) Decline in the social gatherings due to lack of people available (2) LOCAL ECONOMY Decline in service levels (2) Local Businesses become unsustainable (2) Increased unemployment (2) [ANY FOUR]	(4 x 2)	(8)

3.4 A FACTORS RESPONSIBLE FOR THE LOCATION OF URBAN SETTLEMENTS

3.4 A Water – Availability of water, water is piped over longer distances, closer to sources of drinking water (2)
Nature of soil – Clay soils are avoided as they shrink easily. Buildings crack easily due to instability of soil (2)
Geological Structure – Site factor to avoid damages that can result from earthquakes, sinkholes (2)
Relief – Steep slopes are avoided because of the high costs for development (2)
Defensibility- Cape Town and Grahams town are at the foothills of high plateaus (2)
Transport and Trade – The selection of river banks for security purposes (2)
Drainage conditions – Careful consideration due to floods (2)

3.4 B URBAN CONCEPTS

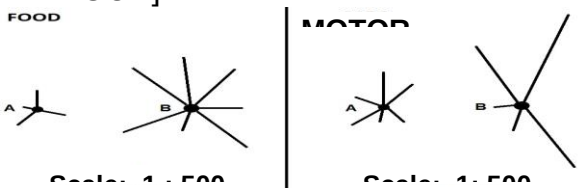
3.4.1 Rural-urban migration (1)
3.4.2 Counter-Urbanisation (1)
3.4.3 Urban expansion (1)
3.4.4 Invasion (1)
3.4.5 Gentrification (1)
3.4.6 Green belt (1)
3.4.7 CBD regeneration (1)
3.4.8 Urbanisation (1)

URBAN HIERARCHY AND CENTRAL PLACES

3.5.1	An urban settlement that provides goods and services to the surrounding rural population (1)	(1 x 1)	(1)
3.5.2	Provide a centre/space for retail of goods and service (2)	(1 x 2)	(2)
3.5.3	The higher the order of the service, the higher the range (2)	(1 x 2)	(2)

3.5.4 The service will become unsustainable as its function will not be supported by a smaller population (2)
The business will become unprofitable as insufficient consumers for the high order good (2)
Affordability of the small threshold population will decrease (2)
The high order service will increase the range (2)

The high order service will increase in inconvenience (2)
[ANY FOUR] (4 x 2) (8)



Must include scale/distance (4 x 2) (8)

MODELS OF URBAN STRUCTURE - HOYT SECTOR MODEL

3.6.1 Land use is predetermined as sectors (1) (1 x 1) (1) (1)

3.6.2 All sectors radiate from the CBD (2) (1 x 2) (2) (2)

3.6.3 The Hoyt sector model is based largely on transportation nodes and networks whereas the South African City was designed to support apartheid regulations (1 x 1) (1) (1)

3.6.4 The multiple nuclei model is based on multiple centres (2)
Certain activities attract people to outlying business districts (2)
Transportation nodes can be used for growth (2)
Accessibility is important to this model (2)
The original CBD is not in the geographical centre (2)
[ANY FOUR] (4 x 2) (8)

URBAN ISSUES - SERVICE DELIVERY ISSUES

3.7.1 The maintenance of road infrastructure is the responsibility of the municipality (2)
Roads enable goods and services to be transported (2)
The maintenance of roads is allocated to provincial budgets (2)
[ANY TWO] (2 x 2) (4)

3.7.2 Costly (2)
Access to communities is limited (2)

	Theft and hijacking (2) Theft of materials (2) Equipment hiring (2) Corruption and Maladministration (2) [ANY THREE]	(3 x 2)	(6)
3.7.3	An unplanned sometimes illegally built dwelling made of reclaimed building materials (1)	(1 x 1)	(1)
3.7.4	Illegally built informal structures (2) Structures are built from old reclaimed materials (2) [ANY ONE]	(1 x 2)	(2)
3.7.5	Demarcate areas for formal development (2) Provide low cost options of permanent structures (2) Provide water and sanitation at affordable pricing (2) Influx control measures that will limit growth (2) Refuse removal services (2) Better policing and monitoring to curb crime levels (2) [ANY THREE]	(3 x 2)	(6)

4.1 ECONOMIC CONCEPTS

4.1.1	Primary (1)		
4.1.2	Agriculture, forestry, and fishing (1)		
4.1.3	General government (1)		
4.1.4	Finance, insurance, and business service (1)		
4.1.5	Tertiary (1)		
4.1.6	2011 (1)		
4.1.7	1.7 (1)		

4.2 AGRICULTURE - FOOD SECURITY

4.2.1	Access to safe, nutritious food (1)	(1 x 1)	(1)

4.2.2	Women (1) Children (1) Elderly (1) {ANY TWO]	(2 x 1)	(2)
4.2.3	Climate (2)	(1 x 2)	(2)
4.2.4	Unemployment (2)	(1 x 2)	(2)
4.2.5	Improve levels of small-scale agriculture (2) Start growing food gardens (2) Improve social security of inhabitants (2) Excess foods to be donated to food drives and soup kitchens (2) Establishment of places of safety that supply food to indigent (2) Improve quality and nutrition of school feeding schemes (2) [ANY FOUR]	(4 x 2)	(8)

4.5 STRATEGIES FOR INDUSTRIAL DEVELOPMENT - SDI

4.5.1	SDI's are transport and communication links between major industrial areas, metropolitan area, and harbours. The idea behind this is that smaller towns along the road, rail and other transport links also benefit from the development of infrastructure and passing traffic (1)	(1 x 1)	(1)
4.5.2	To improve internal trade for export Transportation networks, improve accessibility for trade between SDIs (2) Movement of raw materials by road and rail Movement of finished goods by road and rail (2) Accessibility to markets- virtual and actual SDI`s were developed in underdeveloped areas to develop infrastructure (2) More people so a greater need for infrastructure Improved Technology (2) Will attract more tourists (2) [ANY TWO]	(2 x 2)	(4)
4.5.3	Transportation networks improve accessibility for trade to the SDI Communication networks (2)	(1 x 2)	(2)
4.5.4	Generates employment opportunities (2)		

local community's support tourism (2)
have been united promoting more cooperation amongst them (2)
Greater income for local communities (2)
Money generated is used to develop community projects (2)
Develop ethnic/cultural pride (2)
[ANY FOUR] (4 x 2) (8)

4.6 THE INFORMAL SECTOR

4.6.1 The informal sector includes all unregistered small businesses and hawkers. (1) (1 x 1) (1)

4.6.2 The higher the unemployment rate, the more people tend to seek employment in the informal sector (2) (1 x 2) (2)

4.6.3 Lower economically developed economies (2)
Large scale unemployment (2)
Insufficiently developed secondary and tertiary sectors (2)
Inferior education systems to the developed world (2)
Lack of technological influence on the economy (2)
[ANY ONE] (1 x 2) (2)

4.6.4 Ensure tax revenue is improved (2)
Ensure formal employment with benefits for citizens (2)
Reduction of cheap imported goods (2)
Reduction of illegal goods and services (2)
Improved economic development (2)
[ANY ONE] (1 x 2) (2)

4.6.5 Monitor the sale of illicit and illegal goods (2)
Register businesses formally (2)
Government to regulate tax relief measures (2)
Ensure zoning permits are received that allows legal trading (2)
SABS approval of goods and services (2)
Regulation of minimum infrastructure to improve sale of goods and services (2)
[ANY FOUR] (4 x 2) (8)