



INTERNATIONAL SECONDARY CERTIFICATE EXAMINATION
MAY 2024

GEOGRAPHY: PAPER I

MARKING GUIDELINES

Time: 3 hours

200 marks

These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.

QUESTION 1 INTEGRATED QUESTION: MPUMALANGA PROVINCE, SOUTH AFRICA**1.1 Geographical Skills and Techniques**

1.1.1 South Africa and Mozambique

1.1.2 Four/ 4

1.1.3 North West/ NW

1.1.4 125 km. Accept answers in range of 120 to 130 km.
(Note: To be checked on printed/ final map)

1.1.5 Standerton

1.1.6 Nelspruit

1.1.7 (a) Most of South Africa's coal-fired power stations are located in Mpumalanga as that is where the large coal reserves are found. It is sensible (cheaper) to transmit electricity than to transport coal if power stations were located elsewhere.

- (b) 1. Spatial
 2. Attribute
 3. Attribute
 4. Spatial

(c) (i) Point: location of any of the large coal-fired power stations (including: Matimba, Lephalale, Medupi, Lethabo, Grootvlei, Kendal, Kriel, Kusile, etc – any power station on Fig 2.)
 Any town/ city on Fig 2, e.g. Johannesburg, Polokwane, Mbombela, etc.

(ii) Line: Provincial border; international border

(iii) Polygon: area/ shape of major coalfields; provincial areas; areas of neighbouring countries; area of Indian Ocean on Fig 2.

1.2 Climate and Weather

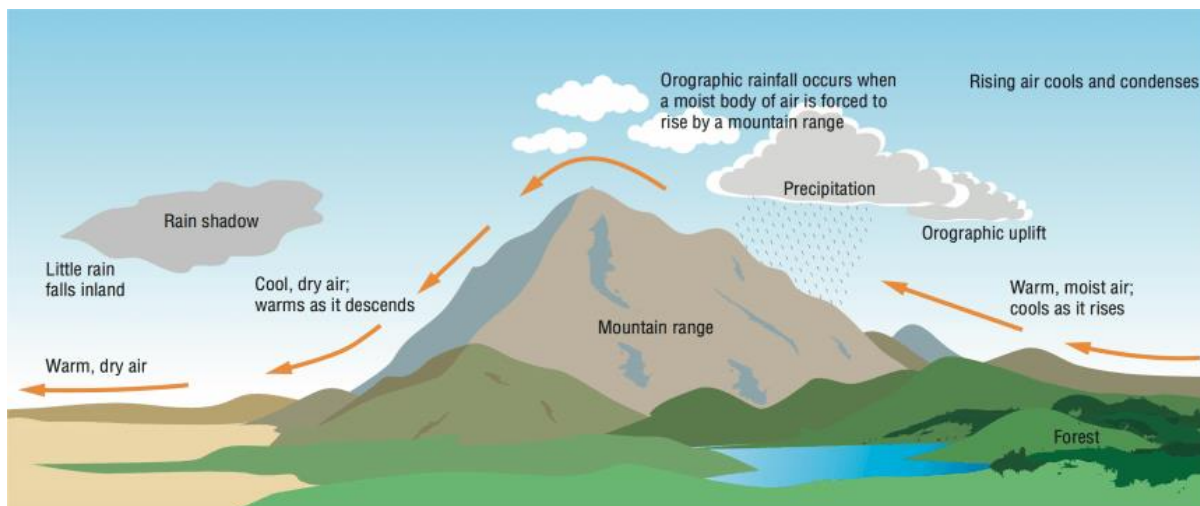
1.2.1 Reasons for isolated afternoon showers and thundershowers along the escarpment in Mpumalanga:

Mark allocation: (3) for written explanation; (3) for labelled diagram. If no diagram, max marks = (3).

- Date of forecast: 21 April – late summer/ early autumn – high daytime temperatures can be experienced on the lowveld/ along the escarpment
- Warm, moist air from Indian Ocean/ coastal lowveld – sub-tropical
- Day time heating – convection – rising air – cooling – condensation – precipitation (hence showers/ thundershowers in the afternoon)

- Escarpment (as evident in Fig 3) is conducive to orographic uplift (relief rain); change in relief/ altitude from lowveld to highveld along the escarpment forces air to rise leading to showers/thundershowers
- Labelled diagram essential:

Diagram below is a guide: Focus is on the right-hand side of the model:



[Source: <Teleskola>]

1.2.2 (a) Why are temperatures higher in Area A than in Area B? Any TWO reasons.

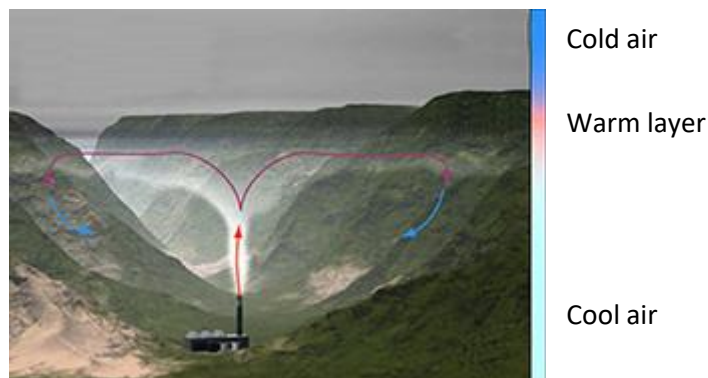
Area A: CBD of Mbombela/ Nelspruit – WARMER temps	Area B: Rural countryside surrounding urban area – LOWER temps
• Built-up area; artificial surfaces; tall buildings, more surfaces, roads/ tar, paving, cement – absorb more radiation – re-radiate radiation • More reflection from roofs, glass, metal, buildings – contribute to higher temps; albedo effect • More cars, trucks, trains, air conditioners – contribute to increasing temps; pollution emitted can 'trap' outgoing longwave terrestrial radiation leading to higher temps • Industry/ factories contribute heat/ pollution • Urban heat island	• Natural countryside – farmland, trees, grass, natural vegetation; absorb less incoming solar radiation • Natural surfaces – less reflection/ absorption • Almost no cars/ trucks/ trains/ air conditioners • No industry

- (b) Why is rainfall higher in Area A than in Area B? Any TWO reasons.

Area A: Mbombela/ Nelspruit CBD More rainfall	Area B: Rural countryside/ farmlands Lower rainfall
• Generally, CBDs/ heavily built-up urban areas receive higher rainfall. • Greater heat (urban heat island) leads to more evaporation, more hot air rising, greater convection. • More hygroscopic nuclei present (required for condensation to take place) due to more pollution in the atmosphere (industry, vehicles, trains, etc.)	• Generally rural areas/ farmlands/ countryside receives less rainfall • Less heat, so reduced evaporation, reduced convection, etc. • Less pollutants so reduced hygroscopic nuclei for precipitation to form

- (c) Impact of Crocodile River valley on pollution over Mbombela/ Nelspruit in winter:
During winter – pollution from industry and vehicles will be 'trapped' in the river valley; katabatic winds transport pollutants down valley, accumulating in the valley; cold/ stagnant air 'traps' the pollution (inversion layer)

Candidates may include a diagram – some key ideas included below:



[Source: <Queensland Gov>]



[Source: <Idaho Dept of Environmental Quality>]

1.3 Geomorphology

- 1.3.1 (a) satellite image/ photo (Source of image: European Space Agency)
- (b) X: meander
Y: confluence/ confluence point
- (c) Northeast/ NE
- (d) *Economic importance of the Crocodile River to people living on the right bank:*
The satellite image indicates agriculture/ farming taking place; irrigation from the Crocodile River; fertile flood plain; fertile soil (alluvium) from flood events; agriculture produces food and earns profits when sold; employment created – supports peoples' needs and livelihoods; water also required/ used for domestic purposes/ possibly light industry. Credit any geographically relevant point.
- (e) *Possible negative impacts of the economic activity on the right bank to the Crocodile River drainage system:*
Farming/ agriculture uses fertilisers/ chemicals/ insecticides/ spays – these harmful substances can enter the river system. The use of water for farming/ irrigation could reduce the volume of water flowing in the river. Fauna/ flora/ ecosystems in the river could be negatively affected.
Credit any geographically relevant points.

1.3.2 Hydrograph

- (a) (i) Discharge: The amount of water flowing in a river channel past a point in a given time. It is measured in m³/sec (indicated on a hydrograph).
- (ii) Base flow: Groundwater that seeps into a river; water underground beneath the water table that seeps into a river through the banks.
- (b) Total amount of precipitation: 8 mm (accept 7 to 9 mm)
- (c) Lag time: 18,5 hrs (accept 18 to 19 hrs)
- (d) Dense vegetation in the area surrounding the Crocodile River will reduce (impede) the surface runoff, leading to greater infiltration – there will be less overland flow. In areas of sparse vegetation, there is little vegetation to intercept the precipitation and allow for infiltration – more overland flow.

1.4 Settlements

1.4.1 Central Place Theory

1.	Fig 7
2.	Fig 7
3.	Fig 8
4.	Fig 7
5.	Fig 8
6.	Fig 8
7.	Fig 7
8.	Fig 8

1.4.2 Settlement of Riverside

- (a) isolated farmstead
- (b) Site of Riverside: On flat/ very gently sloping land, altitude approx. 270 m to 280 m; close to the Crocodile River (water supply – for domestic consumption and for farming), on flood plain, fertile soil adjacent to Crocodile River.
- (c) Situation of Riverside: In the province of Mpumalanga, South Africa; south and west of the Crocodile River/ Kruger National Park; close to border between Mpumalanga and Kruger National Park.
- (d) Mixed farming.
Reasons: Cultivated lands and orchards and vineyards present – indicating different crops cultivated.
 (Monoculture = the cultivation of a single crop). (2 for mixed farming; 2 for reason)

1.5 Economic Geography: ESSAY

Essay subheadings:

The general aims and objectives of the SDI strategy (3)

- To generate investment projects in key economic sectors in specific areas of the country to increase employment in these sectors and areas
- To realise the economic potential in areas
- To bring about economic growth, create employment opportunities, reduce poverty and unemployment
- To unlock economic potential; facilitate new investments along economic 'corridors'
- Stimulate infrastructural development
- Identify strategic investment opportunities
- Restructure post-apartheid South African spatial economy to redress spatial historic inequalities (SDI commenced in 1995)
- To improve transport links
- To develop business and investment environments

Credit any geographically correct statement explaining the general aims of the SDI strategy

The contribution of the MDC to the economies of South Africa, Mozambique and eSwatini (could include Namibia) (9)

Candidates must refer to how the MDC SDI contributes to the economies of SA, Mozambique and eSwatini, giving some examples from the primary, secondary and tertiary sectors.

Some general guidelines:

- Economic/ GDP: Exports out of the respective country/ imports into the respective country (trade corridor)
 - Job creation
 - Port of Maputo – trade
 - Toll road, N4, National Road; railway lines; pipelines
 - Connects land-locked countries and provinces to deep-water port (Maputo); unlocks land-locked regions
 - Important trade corridor for Gauteng – South Africa's economic core/ industrial heartland
 - MDC: Good example of a mixed SDI: industry, agriculture, forestry, tourism
 - Some specific examples:
Mozal Aluminium smelter/ iron and steel plant in Maputo
Foskor: Phalaborwa
SASOL; Petrochemicals; chemicals
Energy
Popular tourist destination (local and international); multiplier effect
Irrigation schemes
Sub-tropical climate (agriculture)
Limpopo and Mpumalanga provinces: agriculture/ mining/ tourism
Tans-Kalahari Corridor links Atlantic Ocean (Namibia) with Indian Ocean (Maputo)
NB. Must include examples from the primary, secondary and tertiary economic sectors
 - Primary: agriculture/ farming; mining; forestry; fishing
 - Secondary: manufacturing
 - Tertiary: services, esp. tourism; government/ administration/ finance
- Credit any geographically correct observations

Challenges faced by the MDC (3):

- Road/ rail / pipeline/ port maintenance
- Sabotage/ theft of infrastructure
- Impacts of 'loadshedding' on economic activities
- Cost of infrastructural development; high logistics costs
- Politics – political instability – internal and external politics – change in government and policies; geopolitical factors
- Corruption, misappropriation of funds
- Reluctance of investors to invest
- Not an easy undertaking to create jobs on a sustainable basis on a large scale
- Governance, regulations, policies – may change
- Damage caused by natural hazards, e.g. tropical cyclones
- Depreciating local currencies; exchange rates; high interest rates
- Huge capital required; substantial loans
- Competition from other regions/ other countries (globalisation)
- Not all parts of the country benefit from SDI; some regions/ parts of the country remain excluded – no benefits
- Border delays/ closures
- Challenges with coordinating different investment sectors (diverse/ mixed)
- Private–public partnerships

Credit any geographically correct statements

Marking Rubric to be followed:

Criteria
Writing Skills • Take into consideration structure and presentation. • Use of brief introduction and conclusion. • Logical discussion and use of subheadings.
Content knowledge • Correct use of geographical terminology and concepts. • Adherence to topic and subheadings – guidelines provided below: – Objectives (3) – Economic contribution (9) – Challenges (3)
Supporting evidence – analysis and understanding • The ability to analyse and evaluate the topic is assessed in this category. • Reference made to case study material/ fact file/ source material. • If appropriate, reference must be made to familiar/ local or other examples.

QUESTION 2 CLIMATE, WEATHER AND GEOMORPHOLOGY**2.1 Travelling weather systems**

2.1.1 (a) (Intense) tropical cyclone (Freddy)

(b) Cold front

(c) Occluded stage / occlusion

(d) South Indian high /Mauritian high / SI anticyclone

2.1.2 This is mid-summer (20 Feb) and there is a prominent cold front passing over the interior of the continent. The high-pressure belt is also in a slightly northerly position for summer.
Unusual for a cold front and a tropical cyclone to be in such proximity.

2.1.3

Compare	Weather system A	Weather system B
Intensity	Very intense – lots of heavy, torrential rain (Black cloud cover – quite dense)	Heavy rain – short showers Less intense (Streaks of black clouds)
Amount	Large amounts which may cause widespread flooding	Less rainfall – could cause localised flooding

2.1.4 Move in a westerly direction / WSW over Madagascar / move towards the Mozambique Channel

2.1.5 The South Indian high is in a **blocking position**. It will **prevent** the tropical cyclone from **veering to the southeast or in a more southerly direction**; rather **causing it to make landfall** over Madagascar and eventually Mozambique.
The mid-latitude cyclone will be **forced to move towards the southeast away from the continent**. Must mention systems A and B to obtain max marks.

2.2 Valley microclimate

2.2.1 Radiation fog / temperature inversion / valley inversion

2.2.2 Early morning / about 08:00 (Range 07:00 to 09:00)

- 2.2.3
- Occurs in the lower valley while the upper slopes remain clear
 - on cold, clear, cloudless nights when terrestrial radiation loss (out-going radiation) occurs rapidly
 - when air temperatures cool below dew-point temperature
 - when low-level condensation occurs.
 - When the sun rises the fog lifts as heat from the sun causes air to rise and the fog dissipates.

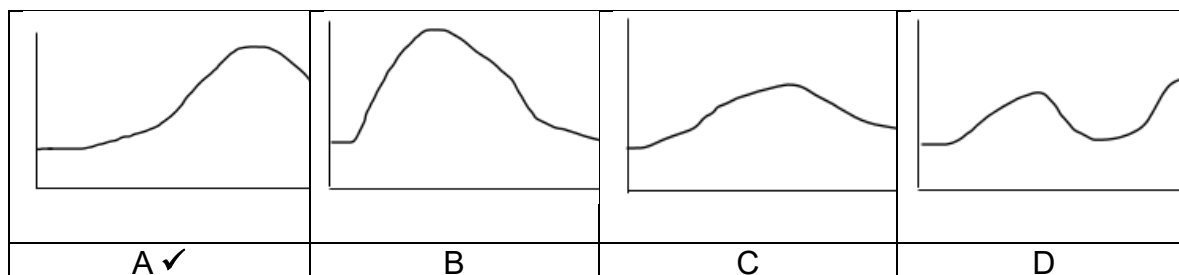
- 2.2.4 • On cold, clear, cloudless nights when terrestrial radiation loss (outgoing radiation) occurs rapidly and the cold air drains into the valley.
- Frost may form at the bottom of the valley **if the temperature drops below 0 °C.**

2.3 The Umzimvubu River catchment area

- 2.3.1 (a) C
(b) D
(c) B
(d) A
(e) A

2.3.2 Refer to Figure 14.

- (a) drainage basin boundary / catchment boundary
- (b) circular / will accept inverted pear shape
- (c) Select the correct hydrograph that illustrates discharge at the hydrometric station (D) in Figure 14. Tick the correct answer.



- (d) Because the upper catchment area is large and circular, the water in the rivers will reach point D after a long lag period. But the water from all the large tributaries will converge within a short period of time; causing a very high peak in the hydrograph.

- 2.3.3 (a) The landscape shows evidence of renewed erosion or **rejuvenation**.
- (b) The river course indicates a river course where the **meanders** are incised.
- (c) The Tina River has a/an **ungraded river** profile.

- 2.3.4 Refer to Figure 14 and the Fact File on the Umzimvubu River, Eastern Cape.
- The Umzimvubu River Water Management team is proposing the construction of a number of major dams in the area. These sites are labelled B to E on Figure 14.

- (a) Select any of the labelled dam sites (B, C, D or E). Explain the site and situation of the dam site you have chosen.

SITE B

Site – in the upper reaches of the Mzintlava River (clean water)

Situation – close to Kokstad – water is needed by the urban community

Good storage dam site.

In KwaZulu Natal

SITE C

Site – confluence of the Kinira and Umzimvubu rivers – gradients possibly steeper and this dam will be deeper

Situation – in the Eastern Cape, SW of Kokstad; SSE of Matatiele

SITE D

Site – four major rivers flow together at this point; will be a large dam or impoundment.

Situation – close to Port St Johns – large urban area; with high population

Good storage dam site; Eastern Cape

Silting may become a problem

SITE E

Site – Flat land; good water supply (major river) / coastal plain
Permanent water supply

Situation – close to Port St Johns/ secure water supply for the inhabitants/close to the coastline

- (b) Evaluate how the construction of the dam you have chosen (in Question 2.3.4 (a)) will be of benefit to the local inhabitants and communities and contribute to a flood management strategy.
Candidates must refer to the Fact File for some of the answers.

- Clean drinking water as water can be stored in dams. The water becomes more accessible to the communities.
- Agriculture / irrigation becomes more accessible / hydroelectricity
- Recreation / job creation / food source
- Dams give flood control measures – reduces high volumes of flooding flow – which can cause washaways and damage to infrastructure
- Prevents roads and bridges from being washed away allowing for more accessibility when flooding does occur – rather than having communities cut off.
- Prevents erosion – more water fills dams and this reduces erosion and undercutting of riverbanks and mudslides. Also means fewer roads will be closed.

Any suitable argument.

QUESTION 3 SETTLEMENT (RURAL AND URBAN) AND ECONOMIC GEOGRAPHY

3.1 Settlement Geography Terminology

- 3.1.1 A
- 3.1.2 D
- 3.1.3 C
- 3.1.4 B
- 3.1.5 B

3.2 Urbanisation and Settlements in Africa

- 3.2.1 Urbanisation: the increase in the proportion or percentage of people living in towns and cities.
- 3.2.2 accept 12% to 14%
- 3.2.3 Lagos, Kinshasa, Cairo (any one)
- 3.2.4 (a) **Housing:** Rapid urbanisation will create an increased demand for housing in urban areas. Informal settlements are likely to increase as there may not be sufficient formal housing to meet the increased demand for housing. Existing formal residential areas will have greater densification – more people will inhabit existing houses/ apartments/ rooms. 'Back-yard' dwellings will increase (second or third dwellings on existing plots/ stands). Increased homelessness as people may not be able to afford or obtain housing. New housing developments will be constructed – new apartment buildings, gated estates, upmarket housing developments, social housing. Importance of demand for housing vs. supply/ availability.
- (b) **Transport and traffic:** Traffic will increase dramatically; traffic jams/ gridlock; increased pollution levels; greater demand for public transport, e.g. taxis, buses. Some cities may develop new, improved public transport systems (e.g. rapid rail, new bus systems, sky trains, underground rail). Rapidly expanding cities may regulate inner-city traffic – discourage people from using personal cars in inner-city areas.
- (c) **Service provision, e.g. water, energy, waste:** Greater demand on such services due to the increased population. Systems may not be able to cope with the increased demand – leading to system failures/ breakdowns, e.g. electricity load-shedding, water cuts, garbage not collected. Cost of such services may increase dramatically. Positive benefits could include more recycling of waste, use of clean energy sources (e.g. solar), harvesting of rainwater.

3.2.5 Africa's rapid urbanisation will affect rural settlements in the following ways:

- Depopulation of rural settlements; rural populations will decline as people move towards urban centres
- Rural–urban migration will increase
- Rural settlements could decline economically/agriculturally: less labour available for farming/caring of livestock
- Some rural settlements may be abandoned completely leading to 'ghost villages' (uninhabited)
- Small local shops may close down as fewer customers; remaining rural dwellers need to travel long distances for goods and services
- Poverty/food shortages in rural areas may increase
- In some cases, older people (and children) may remain in rural areas as the younger (working force) population leave rural areas for urban centres
- Rural regeneration may occur – people see rural areas as desirable, and a counter-flow occurs which could benefit rural areas.

Credit any geographical relevant suggestion

3.3 Economic Geography Terminology

3.3.1 footloose

3.3.2 primary

3.3.3 manufacturing

3.3.4 ports and airports

3.3.5 incentives

3.4 Impact of Changes of Economic Activities

3.4.1 Mining is classified as a primary economic activity as it involves the extraction of natural resources in their raw state from Earth. No manufacturing or processing has taken place.

3.4.2 Possible reasons for mine closure: TWO required.

- gold reserves have run out/ are depleted
- quality of reserves is low, making mining uneconomical, not economically viable
- costs increase (e.g. labour, electricity, transport) making the mine uneconomical
- labour-related issues (e.g. strikes)
- price of gold drops – profits decline
- profits no longer being generated
- company is sold and new owners decide to close operations

Credit any geographically correct point.

3.4.3 Impact of mine closure on people and surrounding towns:

- loss of jobs; loss of income; no longer able to support families
- unemployment, poverty and hunger increase. Could lead to crime due to economic desperation
- former mine workers will leave Otjikoto and move to seek employment; job migration

- shops and businesses supported by the mine will close
- towns and villages surrounding the mine could become 'ghost towns' as residents leave and businesses close
- People may undertake illegal mining in an attempt to earn some money – dangerous and illegal.

Credit all geographically relevant points.

3.5 Formal and informal economic sectors

3.5.1 The taxi business falls into the formal economic sector as it is regulated, controlled by government policies, earnings are declared and taxed.

Some taxis may operate privately (out of the formal system) and form part of the informal economy. These earnings may fall out of the formal tax structure.

3.5.2 These formal economic sectors benefit from the taxi industry:

- New vehicle sales, and used vehicle sales
- Traffic Dept – licensing and registration; traffic fines
- fuel suppliers: petrol, diesel sales, oil
- sale of motor related products and services, e.g., tyres, batteries, panel beating, spray painting, upholstering, windscreens, etc.
- servicing and repairs

3.5.3 The informal traders operating next to the taxi rank benefit from the large number of commuters who will get off from/ on to the taxis at the taxi rank; from early morning to the evening, there will be people in the vicinity of the taxi rank – it will be convenient for them to purchase goods (e.g. fruit, vegetables); it is an ideal place to operate their business from a locational aspect – customers are guaranteed – passing trade.

Total: 200 marks