GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

JUNE EXAMINATION
GRADE 12

2024

MARKING GUIDELINES

GEOGRAPHY

17 pages

SECTION A: CLIMATE AND WEATHER, GEOMORPHOLOGY AND SETTLEMENT GEOGRAPHY

QUESTION 1: CLIMATE AND WEATHER

1.1 1.1.1 ***X– Cold (1)***

1.1.2 ***X – Katabatic (1)***

1.1.3 ***Urban heat island (1)***

1.1.4 ***C (1)/ (i) and (ii)***

1.1.5 ***A (1)/To plant more trees (green areas) in cities***

1.2 1.2.1 ***Summer (1)***

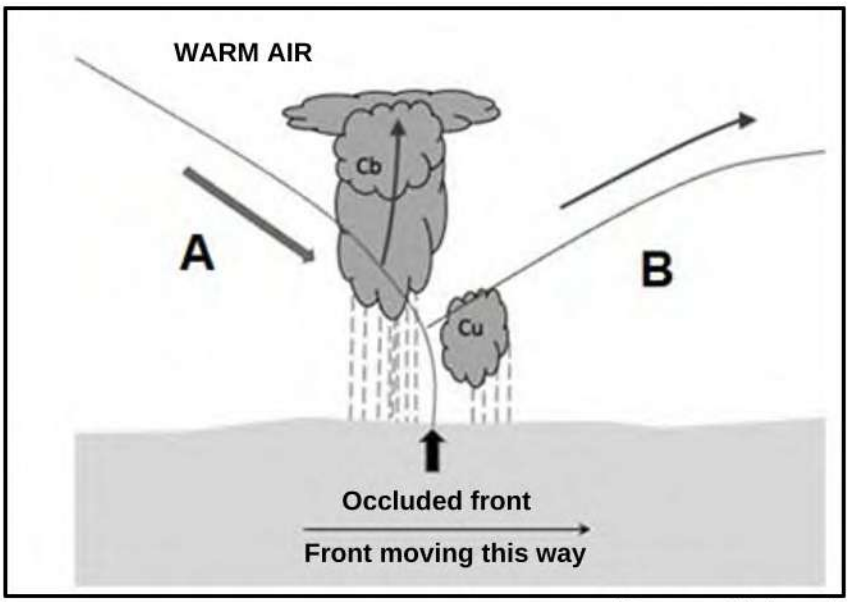
1.2.2 ***moist (1)***

1.2.3 ***Line thunderstorms (1)***

1.2.4 ***Upliftment of warm air by cold air (1)***

1.2.5 ***A (1)/ (i) and (iii)*** (5 x 1) (5)

1.3 Refer to the cross section of an occluded front depicted below and answer the questions that follow.



[Source: Skybrary]

1.3.1 Identify the type of occlusion shown in the sketch above. (1 x 1) (1)

Cold front occlusion (1)

1.3.2 Provide evidence from the sketch above to support your answer to QUESTION 1.3.1. (1 x 2) (2)

- ***Cold air undercutting the warm and cool air in front (2)***
- ***Cold air touching the surface (2)***
- ***Because of the rapid upliftment of the warm air.(2)***
- ***Upliftment of warm front from the surface.(2)***
- ***Cold air touches the surface/ground.(2)***
- ***Steep pressure gradient at the cold front (2)***

(Any ONE)

1.3.3 Identify areas (sectors) **A** and **B** respectively. (2 x 1) (2)

A – cold (1)
B – cool (1)

1.3.4 Discuss how the type of occluded front shown in the sketch above is formed. (3 x 2) (6)

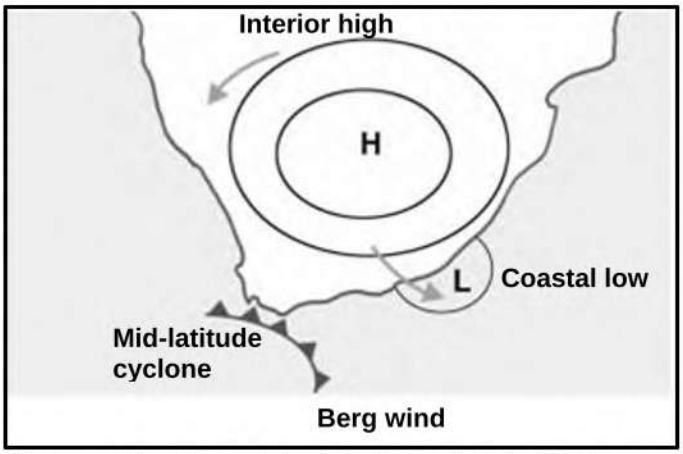
- ***Cold air masses move faster than warm air masses (cold air is heavier) (2)***
- ***The cold air undercuts the warm air and cool air ahead of it (2)***
- ***Cold air(front) overtakes(uplifts) the warm front (2)***
- ***Cold air remains on the surface.(2)***

1.3.5 Account for the weather associated with the occluded front shown in the sketch above. (2 x 2) (4)

- ***Possible thunderstorms – as cold air undercuts warm air forcing it to rise – clouds form resulting in rainfall (2)***
- ***Brings cumulonimbus clouds associated with heavy rainfall. (2)***
- ***Cold dry weather (behind the cold front) – cold air carries less moisture (2)***

ANY TWO

1.4 Refer to the infographic below on Berg winds in South Africa.



[Source: https://www.istockphoto.com/vector/digital-asset-management-by-the-factories-gm687889636-126587633]

DURBAN HITS 41ºC AS BERG WINDS SWEEP THROUGH CITY

Temperatures soared in Durban today as berg winds pushed the mercury up to 43 °C in some parts of the city. The South African Weather Service (SAWS) said certain parts of KwaZulu-Natal would experience extremely hot conditions, causing high levels of discomfort. SAWS said although these temperatures were usually associated with heatwaves, today's heat was a result of berg winds with "high discomfort values ranging from 35 – 45 degrees Celsius expected". The rise in temperature during a Berg wind can be astonishing.

[Source: https://www-iol-co-za.webpkgcache.com/doc/-/s/www.iol.co.za/news/environment/watch-durban-hits-41c-as-berg-winds-sweep-through-city-02107112-3375-481c-a29e-6df7628999e8]

1.4.1 What is a *berg wind?* (1 x 2) (2)

Hot, dry winds blowing in from the interior of South Africa to coastal areas (2) in winter.
[CONCEPT]

1.4.2 In which season do berg winds usually occur? (1 x 1) (1)

Winter (1)

1.4.3 Provide evidence from the infographic to support your answer to QUESTION 1.4.2. (1 x 2) (2)

- ***(Kalahari)High pressure over the interior (2)***
- ***Approaching mid-latitude cyclone (2)***
- ***Presence of a coastal low (2)***

(Any ONE)

1.4.4 Why did the South African Weather Services issue a warning for bergwinds? (1 x 2) (2)

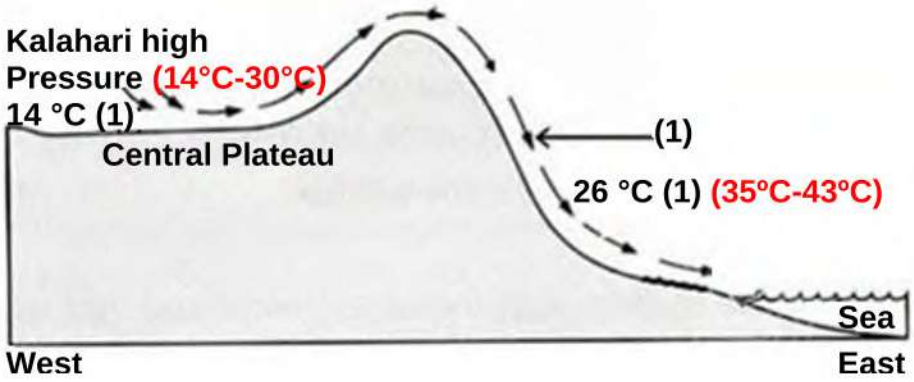
Temperatures soared in Durban today as berg winds pushed the mercury up to 43 °C in some parts of the city (2)

1.4.5 According to the article, list ONE impact the berg winds will have on people of Durban. (1 x 1) (1)

It causes high levels of discomfort (1)

1.4.6 With the use of a well labelled diagram, show the formation of berg winds in South Africa. Your diagram must be a cross section view indicating the following:

(i) The average temperature over the interior
(ii) The average temperature of air along the coast
(iii) The general movement of air (3 x 1) (3)



TAKE NOTE:
The temperatures do not need to be exactly as they are in the diagram, as long as the temperature is at a range close to the temperatures in the sketch above. Temperature above interior must be lower than coastal temperature. Temperature must be indicated in ºC as requested in the QUESTION.

1.4.7 **Explain how** berg winds have a negative impact on the natural environment.

Strong winds can cause soil erosion.(2)
Hot dry winds cause vegetation to dry out.(2)
Friction with dry vegetation and hot wind enhances veld fires.(2)
Hot dry winds decrease soil moisture.(2)
Strong winds will cause the disturbance of the ecosystems.
(Accept examples)
ANY TWO (2 x 2) (4)

[40]

QUESTION 2: GEOMORPHOLOGY

2.1 2.1.1 ***C – lower than (1)***

2.1.2 ***A – gentler (1)***

2.1.3 ***B – 3 (1)***

2.1.4 ***C –steeper gradient, less vegetation and low porosity (1)***

2.1.5 ***B – (ii) and (iii) (1)*** (5 x 1) (5)

2.2 2.2.1 ***Y – Dendritic (1)***

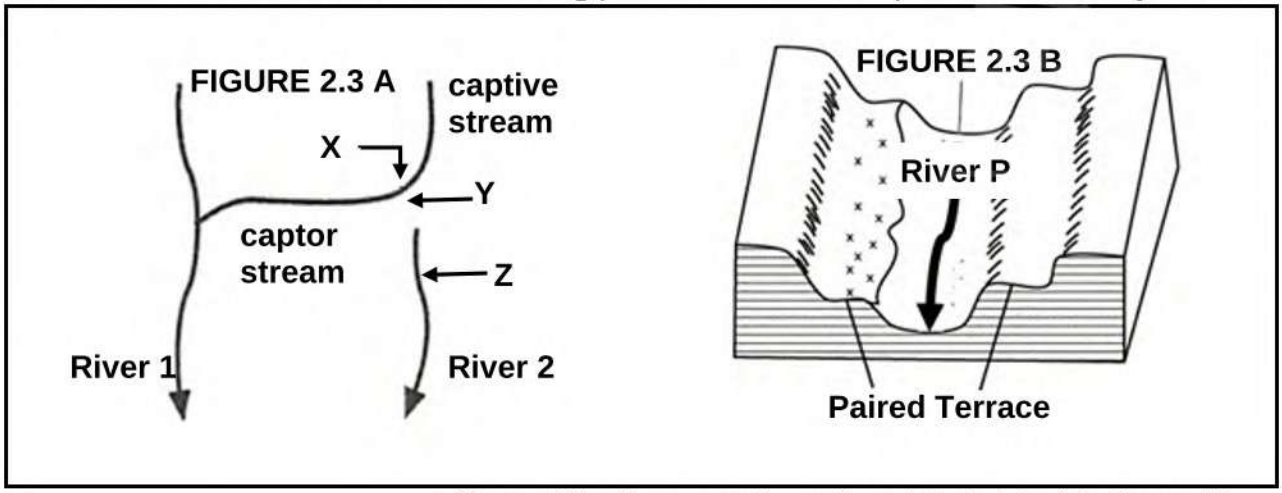
2.2.2 ***Z – Deranged (1)***

2.2.3 ***Y – Trellis (1)***

2.2.4 ***Z – Radial (1)***

2.2.5 ***Z – Rectangular (1)*** (5 x 1) (5)

2.3 Refer to the sketch below showing processes of river capture and river rejuvenation.



[Source:https://www.google.com/search?q=knickpoint+diagram&tbm=isch&hl=en&chips=q:knickpoint+diagram,online]

2.3.1 Define the concept *river capture*. (1 x 2) (2)

River capture: when a more energetic river diverts/steals/(captures) the headwaters of a lesser, energetic stream (2)
[CONCEPT]

2.3.2 Identify features **X**, **Y** and **Z** associated with river capture as indicated in FIGURE 2.3 A. (3)

X – Elbow of capture (1)
Y – Wind Gap (1)
Z – Misfit Stream (1)

2.3.3 Name a climatological factor and geomorphological factor that could enable (allows) river P to undergo the process of rejuvenation. (2)

Climatological – Increase in rainfall (1)
Geomorphological – Drop in sea-level (1)
Rise in land (1)
River capture (1)
Isostatic upliftment.
[Any ONE]

2.3.4 Provide evidence of river rejuvenation in FIGURE 2.3 B. (1 x 1) (1)

Paired terraces/Terraces (1)
Valley within the valley(1)
New flood plains(1)
Knickpoints.
ANY ONE

2.3.5 Explain the impact that river rejuvenation will have on the grading of river **P**. (1 x 2) (2)

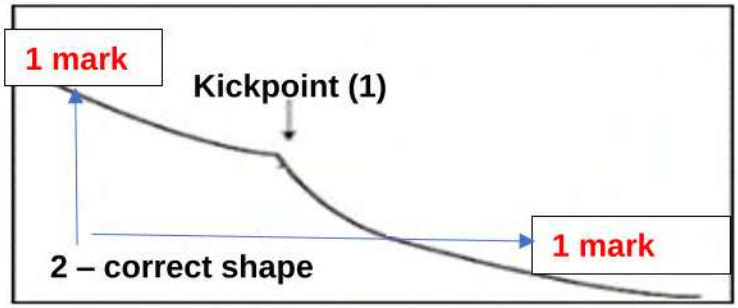
- ***Knickpoints will develop along the river (2)***
- ***The river profile will change from graded to ungraded (2)***
- ***The process of erosion will increase along the river (2)***
- ***The state of equilibrium will be disrupted (2)***

(Any ONE)

2.3.6 Describe the changes that River **1** will undergo due to the process of river capture. (1 x 2) (2)

- ***Increased volume of water (2)(increased discharge)***
- ***Increased carrying capacity (2)***
- ***Less deposition (2)***
- ***More vertical erosion (2)***
- ***Increased velocity (2)***
- ***More energy/high erosive power.(2)***

2.3.7 Draw a well labelled free-hand side view of river **P** after the process of river rejuvenation has taken place, and clearly indicate the position of the knickpoint. (2 + 1) (3)



2.4 Refer to the extract on river management.

POLLUTION IN THE JUKSKEI RIVER

Pollution in the Jukskei River is a multifaceted, generational problem influenced by population expansion, illegal dumping and overwhelmed service providers and lacking infrastructure. Raw sewage runs into the river from informal dwellings on its banks, leaks from blockages in the township, and even sewage leaks from hijacked buildings in Marlboro South. People often see trucks from construction sites in Sandton illegally dumping rubble onto the riverbanks. 'Water is our oldest resource,' says Paul Maluleke, a volunteer with the Alexandra Water Warriors, who are now deploying a nifty device they call "The pollution trap" to snare sewage and plastic in the Jukskei.
On World Water Day we helped to install a floating trap made appropriately of large water bottles, tied with wire to a strong cable and covered with netting, this will catch the floating filth and bottles.

[Source: https://www.google.com/search?q=what+is+drainage+basin+management&sca]

2.4.1 Define the concept *river management.* (1 x 2) (2)

A process of sustaining or maintaining water resources and drainage basins to ensure the availability of clean and safe water for consumption and aquatic life. (Concept) (2)

2.4.2 Identify a cause of pollution from the extract. (1 x 1) (1)

Sewage/Raw sewage flowing into the rivers. (1)
Illegal dumping (1)
Population expansion (1)
Overwhelmed service and infrastructure (1)
(Any ONE)

2.4.3 Quote evidence from the extract that shows that there is an attempt at river management by people living near Jukskei River. (1 x 2) (2)

- ***The use of a pollution trap (2)***
- ***On World Water Day we helped to install a floating trap made appropriately of large water bottles, tied with wire to a strong cable and covered with netting, with which to catch the floating filth and bottles. (2)***
- ***Alexandra Water Warriors, who are now deploying a nifty device they call "The pollution trap" to snare sewage and plastic in the Jukskei. (2)***

(Any ONE)

2.4.4 Explain the importance of river and drainage basin management. (1 x 2) (2)

- ***Rivers provide water for irrigation, household, industrial and mining use. (2)***
- ***South Africa is a dry country experiencing frequent droughts (due to El Nino.) (2)***
- ***It is expensive to purify water (2)***
- ***Avoid waterborne diseases like cholera, polluted water causes waterborne diseases. (2)***
- ***Many people do not have access to tap or bottled water and use water from rivers. (2)***
- ***To protect biodiversity in riverss(accept examples) (2)***

(Any ONE)

2.4.5 In a paragraph of approximately EIGHT lines, discuss the challenges that poor river management will have for the people living along the riverbanks for, e.g., the Jukskei River and suggest sustainable strategies that may be implemented to preserve the rivers and their drainage basins. (4 x 2) (8)

CHALLENGES:

- ***Spread of waterborne diseases like cholera. (2)***
- ***It is expensive to purify water, more money needed for water purification. (2)***
- ***People must travel longer distances to access clean water. (2)***
- ***Drinking dirty water may result in loss of lives due to waterborne diseases. (2)***
- ***Waterborne diseases put high pressure on health systems.(2)***

SUSTAINABLE STRATEGIES:

- ***Awareness campaigns to the communities. (2)***
- ***Buffering of rivers to limit access to rivers. (2)***
- ***Heavy fines for people and companies that are caught littering. (2)***
- ***Maintaining the wetlands as they help purify water. (2)***
- ***Avoiding settlements and developments closer to rivers. (2)***
- ***Regular refuse removal to avoid people dumping in rivers. (2)***

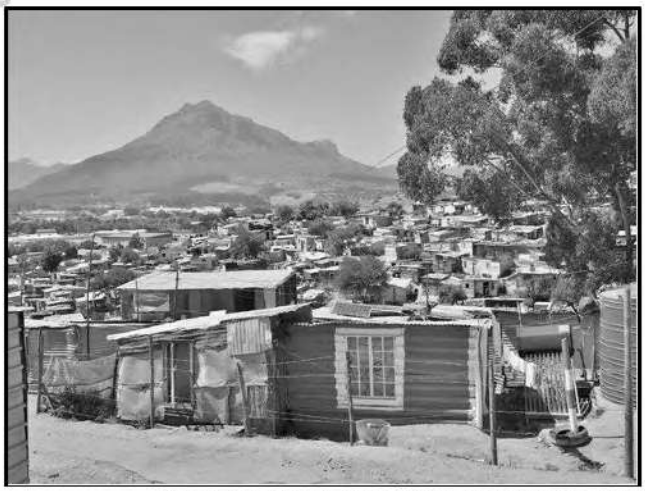
(Any FOUR)
MUST DISCUSS AT LEAST ONE CHALLENGE AND SUSTAINABLE STRATEGY.
Accept examples.

[40]

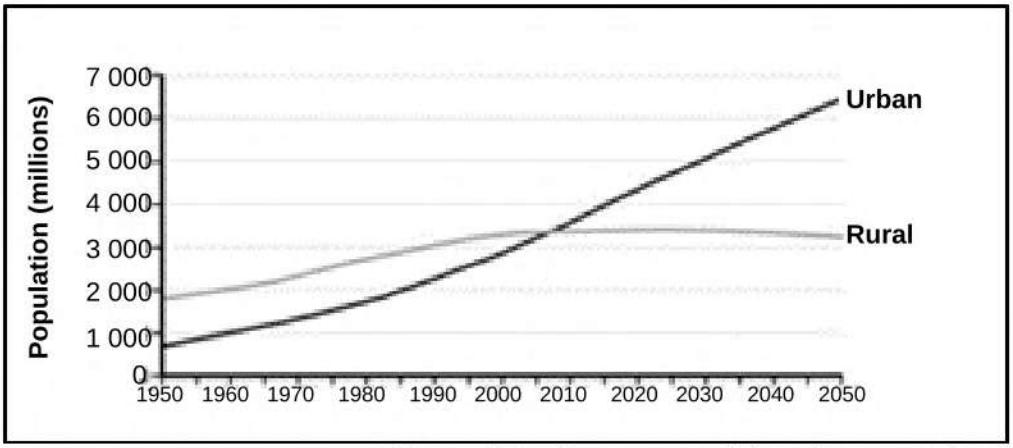
QUESTION 3: SETTLEMENT GEOGRAPHY

3.1	3.1.1	***D (1)***		
	3.1.2	***C (1)***		
	3.1.3	***A (1)/linear road***		
	3.1.4	***A (1)/relief***		
	3.1.5	***A (1)/primary***	(5 x 1)	(5)
3.2	3.2.1	***Z(1) – Low order goods***		
	3.2.2	***Y –(1) High order goods***		
	3.2.3	***Y –(1) High order Centre***		
	3.2.4	***Y – (1)High order***		
	3.2.5	***Y –(1) High order service***	(5 x 1)	(5)

3.3 Refer to the infographic on rural urban migration.



[Source: https://www.bizcommunity.com/Article/196/701/212155.html]



[Source: https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=79940&printable=1]

Unfortunately, city life has its own challenges, as new migrants continue to come which adds to the numbers of the unemployed. This inevitably results in further urban poverty. As a result, the unemployed labour force resort to informal economic activities to ensure its survival.

The unskilled and uneducated new migrants often do not find jobs or find jobs with low incomes. With a low income it is difficult to rent formal urban accommodation. This then results in the mushrooming of slums on the periphery of urban areas. The crime rate and other social ills, such as drug dealing, are also on the rise in urban areas.

[Source adapted: https://jolgri.org/index.php/jolgri/article/view/56/218]

3.3.1 Define the term *rural - urban migration*. (1 x 2) (2)

The movement of people from rural to urban areas (2)
(Concept)

3.3.2 With reference to the infographic, identify the trend in the number of people living in urban areas from 1950 to 2020. (1 x 1) (1)

Increasing (1)

3.3.3 Account for the trend identified in QUESTION 3.3.2. (1 x 2) (2)

People move from rural area to urban area because:

In rural areas:

- ***No jobs available (2)***
- ***Poor services (accept examples) (2)***
- ***Poor education (2)***
- ***Poverty (2)***
- ***Poor medical services (2)***
- ***Poor housing (2)***
- ***Limited socialisation (2)***

In urban areas:

- ***Better/more jobs (2)***
- ***Better services (accept examples) (2)***
- ***Better education (2)***
- ***Better medical services (2)***
- ***Better housing (2)***
- ***Better social lives (2)***

(Any ONE)

3.3.4 Quote evidence from the extract above that suggests that the movement of people into the urban areas has an economic disadvantage. (1 x 2) (2)

Lack of employment/unemployment (2)

3.3.5 According to the infographic, identify ONE social injustice in the urban area that arises from the increase in the urban population. (1 x 2) (2)

- ***Formation of slums (2)***
- ***Crime rate increases (2)***
- ***Drug dealing (2)***
- ***Social ills (2)***

(Any ONE)

3.4.3 Evident in the picture is a sustainable solution to the urban problem. Describe the sustainable solution. (1 x 2) (2)

Better public transport/buses/bus lanes are evident in the photo. (2)
Examples(Reya vaya)

3.4.4 Suggest ONE possible reason why the solution, mentioned in QUESTION 3.4.3, has still not helped to resolve this specific urban problem. (1 x 2) (2)

- ***Public transport is unreliable (2)***
- ***Insufficient public transport (2)***
- ***Public transport is affected by strikes – people cannot get to work (2)***
- ***Public transport does not cover all areas – from home to work (2)***
- ***People prefer using their own cars – safer (2)***
- ***Too many people rely on public transport (2)***
- ***Lack of upgrading of current transport infrastructure (2)***
- ***Lack of road maintenance.(2)***

Any ONE.

3.4.5 In a paragraph of approximately EIGHT lines, discuss how this urban problem negatively impacts commuters. (4 x 2) (8)

- ***Causes stress, frustration and anxiety – due to long periods of time spent in traffic (2)***
- ***Loss of jobs – commuters arrive at work late (2)***
- ***Road rage can escalate– as commuters become impatient (2)***
- ***Increase in the number of accidents – commuters drive recklessly (2)***
- ***Costs are high for commuters – stop and go traffic uses more fuel (2)***
- ***Impact on health of commuters – due to high pollution levels and stress (2)***

- ***Time consuming – people get late to meetings/jobs (can lose income due to hourly rates/lose income)(2)***
- ***Learners arriving late at school-losing teaching time(2)***
- ***Stop and go traffic exposes commuters to smash and grab crimes(2)***

ANY FOUR)

[40]

TOTAL SECTION A: 120

SECTION B

QUESTION 4: GEOGRAPHICAL SKILLS AND TECHNIQUES

4.1 MAP SKILLS AND CALCULATIONS

4.1.1 ***B/2430 DB 07 (1)***

4.1.2 ***A/valley (1)***

4.1.3 Determine the gradient of the slope in block **B2** from spot height 1294 to spot height 1084 if the vertical interval is 210 m and the map distance is 1,7 cm. (3 x 1) (3)

Formula = VI
HE
210m
1,7 cm x 500 = 850 (1) m
210 m (1) (mark for substitution)
850 m
1: 4 (1)

4.1.4 Determine the magnetic bearing from H in block **A3**, where the hiking trail starts, to the bridge in blocks **C4** and **D4**. Use the total change of 9' west (2024). (3 x 1) (3)

New Magnetic Declination 18º14' + 9' = 18º23' west of true north (1)
True bearing: 160º (1) (range: 157º – 163º) (accommodation)
18º23' + 160º = 178º 23' (1) (range: 177º23' – 179º23')

4.1.5 How does the calculation of magnetic bearing assist hikers in this area? (1 x 2) (2)

- ***So that they do not get lost (2)***
- ***Find the correct direction (2)***
- ***Find their destination (2)***

(Any ONE)

4.2 MAP INTERPRETATION

4.2.1 Refer to the settlements at **I** on the orthophoto map.

(a) Give a possible climatological factor for the location of the settlements on the slope at **I**. (1 x 1) (1)

It is in a valley – the climatological factor will be the temperature inversion (1)

(b) Give a reason for your answer to QUESTION 4.2.1 (a). (1 x 2) (2)

Middle slopes are warmer/ thermal belt is warmer. (2)

Refer to the topographic map.

4.2.2 (a) Give evidence of a temporary base level of erosion from the generational information. (1 x 1) (1)

(Kadishi) Waterfall (1)

(b) Identify the fluvial landform in blocks **D4** and **E4**. (1 x 1) (1)

Meander (1)
Incised meander (1)
ANY ONE

Refer to block B3 on the topographic map.

4.2.3 (a) Name the drainage pattern in block **B3**. (1 x 1) (1)

Parallel (1)

(b) Give a reason for the pattern in block **B3**. (1 x 2) (2)

Streams flowing parallel to each other with an interfluve in between the streams (2)
The slope is steep and therefore streams are shorter (2)
ANY ONE

4.2.4 ***C/(i) and (iv) (1)*** (1 x 1) (1)

4.2.5 Give an advantage of the location of the settlements at **G,** evident on the topographic map. (1 x 2) (2)

Easy access to the road (2)

4.2.6 List ONE low order service offered by the settlement Apara in block **E1**. (1 x 1) (1)

School (1)

4.3 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

4.3.1 Name TWO components of GIS that was used to compile the orthophoto map. (2 x 1) (2)

- ***People (1)***
- ***Processes (1)***
- ***Hardware (1)***
- ***Software (1)***

4.3.2 Name ONE data layer in block **B2** on the orthophoto map. (1 x 1) (1)

- ***Topography (1/) (Contour lines*)**

Refer to the topographic map.

4.3.3 (a) How is spatial data represented in block **D1**? (1 x 2) (2)

- ***By means of a line symbol (2)(hiking trail)***
- ***By means of a point symbol (2)Spot height)***
- ***By means of a polygon symbol (2)(cultivated land)***

(Any ONE)

(b) Give the attribute data for the polygon feature in block **D1**. (1 x 1) (1)

Cultivated land (1)/

4.3.4 Why is data manipulation beneficial for a GIS company? (1 x 2) (2)

They can only use/buy/obtain the specific data they need for their company (2)
To organise data for their company(2)
Do corrections/change scale/change data for usage(2)
Update data/standardize the data for easy usage(2)
[Any One]

TOTAL SECTION B: 30

TOTAL: 150