SENIOR SECONDARY INTERVENTION PROGRAMME 2013

education
Department: Education
GAUTENG PROVINCE

GRADE 12

GEOGRAPHY

LEARNER HOMEWORK SOLUTIONS

The SSIP is supported by

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LEARNER HOMEWORK SOLUTIONS

TOPIC 1: CLIMATE AND WEATHER SA AND THE WORLD: CHANGE IN ENERGY BALANCE – THE DEVELOPMENT OF WINDS AND GLOBAL CIRCULATION

SOLUTIONS TO HOMEWORK

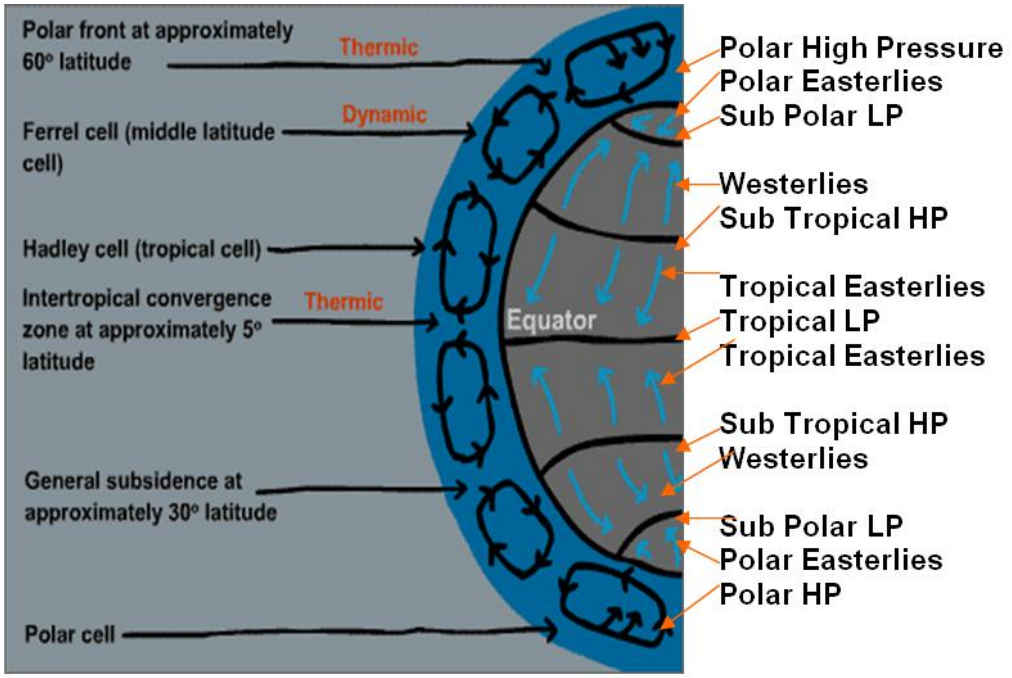
TOPIC 1: CLIMATE AND WEATHER

QUESTION 1

1. False – temperature and pressure differences
2. False – dynamically driven
3. True
4. True
5. True
6. False – clockwise to a low pressure in the southern hemisphere
7. False – subsiding air
8. True
9. False - 60º North and South.
10. TrueFont: Arial 12 **[10]**

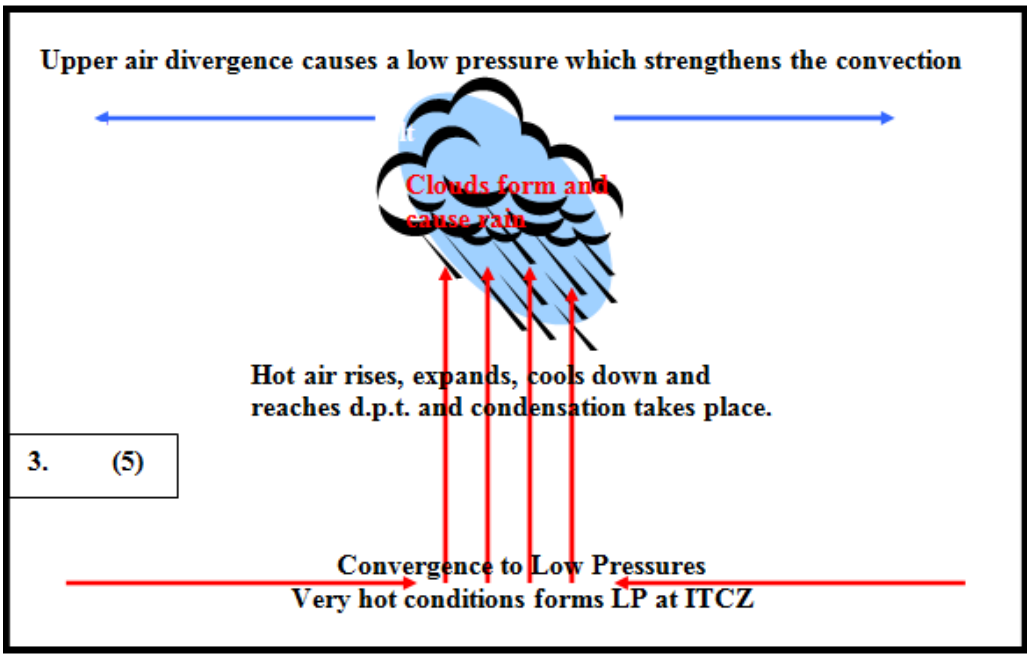
QUESTION 2

2.1.1 (3)
2.1.2. (7)
2.1.3. (6)
2.1.4. for each correct label on the diagram (3)



2.2 Temperature differences that lead to pressure differences and pressure gradients that cause wind. (2)

2.3.



2.4. Owing to rising of air there is very little horizontal movement of air. There are rain and windless conditions. (3)

2.5. Air descends / sinks anticlockwise and then moves outward from the high Pressure on the surface. (3)

2.6. The cold polar easterlies and the much warmer westerlies. (2)

2.7. The heat equator (ITCZ) influence the positioning of the primary circulation cells as it follows the direct sunlight through the year. In September and March it will be near to the equator, but the ITCZ and all the circulation cells will move north in June and South of the equator in July. (4)

2.8. Coriolis force is absent (1)

2.9. At the polar fronts. (1)

2.10. Coriolis force deflects winds to the left of their original directions in the Southern hemisphere and to the right of their original direction in the Northern hemisphere. (2)

2.11. Upper air divergence causes a low pressure in the upper air which strengthens the convection currents. (2)

2.12. Temperature increases at D.A.L.R. 1ºC/100m
Humidity decreases,
Air pressure increases (3)

2.13. Unstable air rises and cools down at D.A.L.R. 1ºC/100m
When it reaches d.p.t. condensation takes place and latent heat is released
Temperature only then drops at W.A.L.R. 0,5ºC/100m
It will stop rising as soon as it is not warmer than the surrounding air. (3)

[50]

TOPIC 2: SECONDARY AND TERTIARY CIRCULATION

SOLUTIONS TO HOMEWORK

QUESTION 1

1.1.1 True ✓✓
1.1.2 True✓✓
1.1.3 False✓✓
1.1.4 False✓✓
1.1.5 False ✓✓ **(5 x 2) [10]**

QUESTION 2

2.1.1 False ✓✓
2.1.2 True ✓✓
2.1.3 True ✓✓
2.1.4 False ✓✓
2.1.5 False ✓✓ **(5 x 2) [10]**

QUESTION 3

3.1.1 During the night the air is cooler ✓✓
Cooler air heavier and denser thus more subsidence ✓✓
Pollution dome pushed lower down ✓✓
During the day the air is warmer ✓✓
Warmer air lighter and less dense and rises ✓✓
Pollution dome lifts higher up ✓✓ **[Any TWO]** (2 x 2) (4)

3.1.2 Global warming/greenhouse effect ✓✓ (1 x 2) (2)

3.1.3 Cut down the amount of pollution given off in the city ✓✓
Taller chimneys/stacks to release pollutants above inversion ✓✓
Limit industrial activities at night time ✓✓
Use cleaner fuels in engines ✓✓
Legislation and fines to reduce pollution ✓✓
Greenbelt development ✓✓
[Any ONE – Accept any other logical answer] (1 x 2) (2)

3.1.4 [Must make at least ONE reference to each of the aspects.]
[Single marks only if answered in point form and not in paragraph / essay style]
(6 x 2) [12]
[Award single marks if no labels] (3 x 2) [6]
[20]

TOPIC 1: MID-LATITUDE CYCLONES

SOLUTIONS TO HOMEWORK

QUESTION 1

1.1.1 a) Mid-latitude / temperate cyclone / mid-latitude depression / frontal depression / extra-tropical cyclone ✓✓ (1 x 2) (2)

b) Winter ✓✓ (1 x 2) (2)

c) West to east / eastward / to the east ✓✓ (1 x 2) (2)

d) Situated in the westerly wind belt ✓✓ (1 x 2) (2)

e) Driven by the westerly winds ✓✓ **[Any ONE]** (1 x 2) (2)

1.1.2 **Value of weather forecasts and warnings:**

To alert people timeously (2)
Possible precautionary measures can be taken (2)
Evacuation can take place (2)
Preparation can be done in terms of protection for harsh weather (2)
Fishermen will know not to go out on the sea (2)
Cancel outdoor activities (2)
Rescue services alerted beforehand (2)
Tourists can adjust their plans [Accept others] ✓✓✓✓✓✓ (2)

Role of the public:

Forecasts will be localised and not generalised (2)
Used for further research (2)
Will improve predictions (2)
Preventative measures can also be localised (2)
✓✓ ✓✓✓✓ **[Accept others]**

[Must make at least ONE reference to each of the aspects.]
[Single marks only if answered in point form and not in paragraph / essay style] (6 x 2) [12]

[Award single marks if no labels] (3 x 2) [6]

[26]

QUESTION 2

2.1.1 B (2) ✓✓
2.1.2 D (2) ✓✓
2.1.3 C (2) ✓✓
2.1.4 A (2) ✓✓
2.1.5 A / B /D (2) ✓✓ (5 x 2) **[10]**

TOPIC 2: TROPICAL CYCLONES

SOLUTIONS TO HOMEWORK

QUESTION 1

1.1.1 Develop along east coast √√
Latitudinal position similar √√
Move away from equator √√
Move east to west √√
Develop over warm tropical ocean √√
Develop on western side of ocean √√ [Any ONE] (1 x 2) (2)

1.1.2 Originate between 5° - 25°N and S √√
Need Coriolis force that comes into operation at 5° √√
Coriolis force does not exist at equator √√
Situated over hot ocean / 26°C - 27°C √√
Greatest evaporation between 5° - 25° N and S √√
Latent heat needed for development, stored in water vapour √√
Large scale condensation √√
Temperature high in these latitudes √√
Low pressure √√
Cyclones do not develop where there are high pressures / anti-cyclones √√
Develop along east coast √√ [Any THREE] (3 x 2) (6)

1.1.3 Global warming increases temperatures √√
Ocean temperatures increase and stay warmer for longer √√
Increased temperatures increase evaporation / humidity / condensation √√
Leads to the release of more latent heat √√
Leads to the deepening of the low √√
More energy thus more intense hurricanes developing more often √√
[Any THREE] (3 x 2) (6)

1.1.4 Southern Africa is shielded / protected by Madagascar √√
Tropical cyclones dissipate over Madagascar / friction over Madagascar √√
Steered away by South Indian Anticyclone / High Pressure √√
Recurved away from coast √√
Move to colder ocean √√ [Any ONE] (1 x 2) (2)

1.1.5 **United States of America**

USA is a developed nation √√
USA has more and better developed infrastructure √√
Eastern coastal areas low lying and damage occurs readily √√
More can be damaged √√
Warning systems are readily available √√
Earlier evacuations can take place √√
Better rescue services √√
Health facilities are more readily available √√
Less loss of life √√

Southern Africa

Southern Africa includes developing nations compared to the USA √√
Southern Africa has little and poorly developed infrastructure √√
Less can be damaged √√
Warning systems are not able to reach the majority of the population as some of them are in deep rural areas √√
Few early evacuations can take place √√
Not enough rescue services √√
Few health facilities are available √√
More loss of life √√
[Candidates can refer to EITHER some aspects for the USA and some for southern Africa **OR** can answer as comparison.]
[Single marks only if answered in point form and not in paragraph / essay style] (6 x 2) (12)

[28]

QUESTION 2

2.1.1 Tropical cyclones – or mention Eline/Favio √√ (1 x 2) (2)

2.1.2 Surface wind strength between 110 – 210 km/h √√
Very low pressure/±930 hPa √√
Temperature above 27 °C √√ [Any TWO] (2 x 2) (4)

2.1.3 Warm ocean - above 27 °C √√
Needed to provide heat energy and moisture √√
- High evaporation rate √√
For condensation and latent heat to be released √√
- Located between 5° - 30° north / south of the equator √√
As the coriolis force is ineffective at the equator (0° - 5°) √√
- Unstable air √√
Air caused to rise √√ [Any TWO factors + an explanation] (4 x 2) (8)

2.1.4 Cyclones dissipate before reaching the coast of South Africa because the conditions necessary to sustain cyclones such as a warm ocean (27 °C) are not there √√
When cyclones reach Madagascar the intensity is reduced by friction √√
and lack of moisture √√
South Africa is located around the 30° latitude which puts it just beyond / too far south of latitudinal range for cyclones √√
[Any TWO or other reasonable answer] (2 x 2) (4)

2.1.5 Radio detection and ranging √√ (1 x 2) (2)

2.1.6 (a) Radar is used to predict cloud formation and storms which can lead to flooding
Lightning and thunder and associated hail can be observed with radar. √√ (1 x 2) (2)

(b) The change of water levels can be measured accurately with radar and rising levels can serve as a warning for evacuation√√ (1 x 2) (2)
[24]

TOPIC 1: FACTORS THAT INFLUENCE SA WEATHER

SOLUTIONS TO HOMEWORK

QUESTION 1

1.1.1 A rise / increase in temperature with increase in altitude ✓✓

[Concept] (1 x 2) (2)

1.1.2 B ✓✓ (1 x 2) (2)

1.1.3 Inversion layer is above the escarpment ✓✓
The base of the inversion is higher above sea level
Moist air is advected onto the plateau ✓✓ [Any ONE] (1 x 2) (2)

1.1.4

Summer:

Moist air will reach the interior ✓✓
High humidity ✓✓
More condensation ✓✓
Cloud formation ✓✓
Precipitation ✓✓
Smaller temperature range ✓✓

Winter:

Moist air prevented from reaching interior ✓✓
Low humidity ✓✓
Little condensation ✓✓
No / few clouds ✓✓
Colder night temperatures ✓✓
Frost may occur ✓✓
Larger temperature range ✓✓

[Any FOUR. Must refer to summer and winter] (4 x 2) (8)

[14]

QUESTION 2

2.1.1 summer ✓✓
2.1.2 coastal low ✓✓
2.1.3 15 °C ✓✓
2.1.4 southwest ✓✓
2.1.5 drizzle ✓✓ (5 x 2) **[10]**

QUESTION 3

3.1.1 A = summer ✓✓
B = winter ✓✓ (2 x 2) (4)

3.1.2 Kalahari / Continental High Pressure Cell ✓✓ (1 x 2) (2)

3.1.3 Descending air ✓✓
Air warms adiabatically as it goes down ✓✓
Blocks moisture from reaching the interior ✓✓
No condensation will occur ✓✓
[Any TWO] (2 x 2) (4)

3.1.4 B ✓✓ (1 x 2) (2)

3.1.5 (a) From 0 to 1 000 m there is a decrease in temperature with height ✓✓
At Y there is an increase in temperature with height ✓✓
Above Y there is a decrease in temperature with height ✓✓
(3 x 2) (6)

(b) Temperature inversion ✓✓ (1 x 2) (2)

[20]

TOPIC 2: TRAVELLING DISTURBANCES

SOLUTIONS TO HOMEWORK

QUESTION 1

1.1. c. ✓✓
1.2. a. ✓✓
1.3. b. ✓✓
1.4. a. ✓✓
1.5. a. ✓✓
1.6. b. ✓✓
1.7. a. ✓✓
1.8. b. ✓✓
1.9. d. ✓✓
1.10. b. ✓✓ (10 x 2) **[20]**

QUESTION 2

2.1.1. Summer conditions ✓✓ (1 x 2) (2)

2.1.2. Tropical cyclone Celestine is present ✓✓
High temperatures over the county ✓✓
Cloud cover over the summer rainfall region ✓✓
Low pressure cells over the country ✓✓
Mid-latitude cyclones and subtropical high pressure belt far south of country ✓✓
(3 x 2) (6)

2.1.3 Tropical cyclone ✓✓ (1 x 2) (2)

2.1.4 Tropical cyclones develop over the sea in the tropical areas. ✓✓
The water must be warmer than 28ºC which leads to a lot of evaporation and very hot, humid, unstable air. ✓✓
The hot air starts rising and forms an intense low pressure on the surface. ✓✓
The tropical jet stream in the upper air causes an upper air low pressure and this intensifies the low pressure on the surface. ✓✓
Air is sucked into the low pressure. If this happens outside 5ºN and S, Coriolis force will cause the winds to spiral towards the low pressure. ✓✓
(4 x 2) (8)

2.1.5. Torrential rain ✓✓
Hurricane strength winds ✓✓
Extreme low pressure ✓✓
Large waves at sea and storm surge on sea ✓✓ (3 x 2) (6)

2.1.6. North eastern part of Mpumalanga and KwaZulu Natal ✓✓ (1 x 2) (2)

2.1.7. When the tropical cyclone moves over land ✓✓
the wind is slowed down by friction ✓✓
and there is less evaporation to cause unstable air conditions. ✓✓
The cyclone also moves into cooler sub-tropical areas and the air pressure increases. ✓✓
The weather clears up. ✓✓ (3 x 2) (6)

2.1.8. In summer the subtropical high pressure belt moves south with the heat equator. ✓✓
The subsiding air masses and clear conditions shift to south of the country. ✓✓
Moist tropical air masses bring in humid air over the interior which causes summer rain at the moisture front along the centre of the country. ✓✓
Cool dry air from the south west meet and lift up warmer moist air from the north east. ✓✓
This cause cloud formation and rain.✓✓
Low pressures occur over South Africa. ✓✓ (3 x 2) (6)

2.2.1. Winter conditions ✓✓ (1 x 2) (2)

2.2.2. Cold clear conditions over the interior ✓✓
Well-developed Kalahari high pressure over the central plateau ✓✓
Mid-latitude cyclones influence weather in the Cape and cause frontal rain.✓✓
Sub-tropical high pressure belt near SA and further north than in summer ✓✓
Berg wind conditions in Durban ✓✓ (3 x 2) (6)

2.2.3. Mid-latitude cyclones ✓✓ (1 x 2) (2)

2.2.4. Temperature dropped ✓✓
Cloud cover – overcast can experience thunder storms ✓✓
Air becomes dry ✓✓
Air pressure increasing ✓✓
Wind direction is changing ✓✓ (3 x 2) (6)

2.2.5. The cold dense air moves faster and pick up the light humid less dense air in the warm sector. ✓✓
This leads to Cumulonimbus clouds to form and heavy rain along the cold front. ✓✓
The temperature and humidity decreases at the cold front while the air pressure increases. ✓✓
The air at the cold front is lifted quickly and thus thunderstorms develop at the cold front. ✓✓ (3 x 2).(6)

2.2.6. Atlantic Ocean high pressure cell ✓✓
Kalahari high pressure cell ✓✓
Indian Ocean high pressure cell ✓✓ (3 x 2) (6)

2.2.7. Clear cool dry conditions persist over the summer rainfall area in the interior of SA. ✓✓
Mild days and cold nights due to fast radiation as air is very dry ✓✓
Frost occurs on Highveld and in frost pockets of valleys ✓✓ (3 x 2) (6)

2.2.8. Winter weather in SA is dominated by the subtropical high pressure cells over and next to the country. ✓✓
The subsiding air causes a temperature inversion which prevents all the moist maritime air from entering the interior. ✓✓
A temperature inversion occurs over the country ✓✓ (3 x 2) (6)

[78]

TOPIC 3: CLIMATE CHANGE AND CLIMATE HAZARDS

SOLUTIONS TO HOMEWORK

QUESTION 1

1.1. Carbon ✓✓
Carbon dioxide ✓✓
Carbon monoxide ✓✓ [Any ONE] (1 x 2) (2)

1.2 Artificial material used to construct the city, e.g. concrete, steel and tar which absorb and retain heat ✓✓
Tall buildings increase the surface area that absorbs heat ✓✓
Multiple reflection of heat by buildings made from glass and mirrors ✓✓
City activities generate heat, e.g. air conditioners, streetlights, body heat (2) ✓✓
Lack of surfaces from which evaporation takes place ✓✓
Pollution in the city increases and traps heat ✓✓
Heat trapped inside buildings ✓✓
[Any TWO. Accept any other reasonable answers] (2 x 2) (4)

1.3 methane gas ✓✓ (1 x 2) (2)

1.4 Loss of valuable topsoil due to erosion ✓✓
Crops are swept away/damaged and destroyed ✓✓
Prices of products go up ✓✓
Less food production ✓✓
Livestock die ✓✓
Food has to be imported ✓✓
Damage to infrastructure makes it difficult to transport farm products ✓✓
Equipment and agricultural land can be buried in silt ✓✓
Impact on subsistence farmers is greater and they may not be able to recover ✓✓
Loss of income ✓✓
[Any TWO. Accept any other reasonable answers] (2 x 2) (4)

1.5 An international agreement by countries to reduce their greenhouse emissions ✓✓
More efficient use of energy ✓✓
Use of renewable sources of energy ✓✓
Sustainable forms of agriculture ✓✓
Legislation to limit deforestation ✓✓
Planting of trees (afforestation)/helps to absorb carbon dioxide ✓✓
Reduce emission from waste and transport sector ✓✓
Reduce consumption of beef to control methane emissions ✓✓
Have a monitoring mechanism to ensure that countries abide by international agreements such as the Kyoto or Copenhagen Protocol ✓✓
Countries that exceed their carbon footprints be fined ✓✓
Roof gardens on high-rise buildings ✓✓

Educate people on the efficient use of electricity, e.g. use of energy-saving globes, solar heating ✓✓

Reduce the burning of fossil fuels, e.g. coal ✓✓

[Any SIX. Accept any other reasonable answers] (6 x 2) (12)

[If listed and only words/phrases used, ONE mark - If full sentences Used, TWO marks] **[24]**

TOPIC 1: MULTIPLE CHOICE QUESTION ON MAPWORK

SOLUTIONS TO HOMEWORK

QUESTION 1

1.1. D✓✓
1.2. B✓✓
1.3. A✓✓
1.4. A✓✓
1.5. C✓✓
1.6. C✓✓
1.7. B✓✓
1.8. D✓✓
1.9. A✓✓
1.10. C✓✓
1.11. B✓✓
1.12. A✓✓
1.13. A✓✓
1.14. C✓✓
1.15. A✓✓
1.16. C✓✓ (16 x 2) **[32]**

TOPIC 3: GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

SOLUTION TO HOMEWORK

QUESTION 1

1.1

1.1.1 Computer based technology and method for collecting, analysing, managing, modelling and presenting geographical data for a wide range of uses √√

[CONCEPT] (1 x 2) (2)

1.1.2 Gathering of information about the earth with any instrument from outer space √√ [CONCEPT] (1 x 2) (2)

1.2 Vector: Real world is shown by means of points, lines and polygons ✓✓
Raster: Real world features shown by means of pixels ✓✓

[CONCEPT] (2 x 2) (4)

1.3.1 • Maps √√
• Images √√
• Tables (electronic spread sheet) √√
• Statistics √√ (1 x 2) (2)

1.4.1 (a) Attribute data √√ (1 x 2) (2)

(b) Spatial data √√ (1 x 2) (2)

1.5. • Area of school • Passage / corridors √√
• Grounds • Walkways √√
• Point of entrance √√ [Any ONE] (1 x 2) (2)

[16]

QUESTION 2

2.1 • Hardware √√
• Software √√
• Data √√
• People √√
• Procedures √√
• Network √√ [Any TWO] (2 x 2) (4)

2.2 Polygon feature: cultivated land √√
woodland √√
sewage disposal works√√
cemetery √√
slimes dam √√
mine dump √√
built-up area √√
Line feature: non-perennial river √√
other road √√
national route √√
track/hiking trail √√
railway line √√
Point feature: fountain √√
trees √√
[Any ONE for each type of feature] (3 x 2) (6)

2.3.1 The integration of data from different maps into one map which summarises the overlaying process √√ [CONCEPT] (1 x 2) (2)

2.3.2 Maps have different scales √√
Different map projections are used on maps √√
Different georeferenced maps are used √√
[Any ONE] (1 x 2) (2)

2.3.3 A summary of integrated data is produced which makes it easier to analyse data
(1 x 2) (2)

2.4 A storage system with linked tables
OR
Data is stored in tables which are linked to other tables [CONCEPT] (1 x 2) (2)

2.5 • Correct distortions
• Sharpen definition
• Ensure colour consistency
• Correct latitude and longitude registration
• Makes data more manageable [Any TWO] (1 x 2) (2)
[20]

QUESTION 3

3.1. A map projection is a method to flatten out the spherical earth onto a flat surface to draw a map. (1 x 2) (2)

3.2. Mercator projection (1 x 2) (2)

3.3. Gauss Conform Projection (1 x 2) (2)

3.4. Gauss Conform is always used on topographic maps as it conserves distance and area on large-scale maps to a large degree. Direction and bearing is not distorted too much. (2 x 2) (4)

[10]

TOPIC 1: RIVER SYSTEMS AND RIVER SYSTEM MANAGEMENT

SOLUTIONS TO HOMEWORK

QUESTION 1

1.1 True ✓✓ (1 x 2) (2)

1.2 True ✓✓ (1 x 2) (2)

1.3 False ✓✓ (1 x 2) (2)

1.4 True ✓✓ (1 x 2) (2)

1.5 False ✓✓ (1 x 2) (2)

[10]

QUESTION 2

2.1 (a) The total area drained by the river system ✓✓ [CONCEPT] (1 x 2) (2)

(b) The main river and all its tributaries ✓✓ [CONCEPT] (2 x 1) (2)

2.2 A = round ✓✓ (1 x 2).(2)

B = elongated/long ✓✓ (2 x 2) (4)

2.3 Nature of rainfall ✓✓ – Soft rain less run-off; storms more run-off ✓✓

Vegetation ✓✓ – More vegetation less run-off; less vegetation more run-off ✓✓

Relief of the land ✓✓ – Where land is steep more run-off; where land is gentle less run-off✓✓

Rock type ✓✓ – porous and permeable rock will have less run-off; impermeable rock will have more run-off ✓✓

Soil type ✓✓ – coarse sandy soil promotes infiltration; compact soils promote run-off ✓✓

Soil moisture content ✓✓ – Saturated soils promote run-off; dry soils promote infiltration ✓✓

Evaporation ✓✓ – high evaporation reduces run-off and infiltration; low evaporation increases run-off and infiltration ✓✓

[Any TWO. Must give factor ✓✓and explain ✓✓] (4 x 2) (8)

2.4 A = E ✓✓

B = F ✓✓ (2 x 2) (4)

[24]

TOPIC 2: RIVER CAPTURE AND RIVER PROFILES

SOLUTIONS TO HOMEWORK

QUESTION 1

1.1 Pirated / captured / beheaded stream ✓✓

1.2 Misfit / beheaded ✓✓

1.3 Elbow of capture ✓✓

1.4 Windgap / dry gap ✓✓

1.5 Captor / pirate stream ✓✓ (5 x 2) **[10]**

QUESTION 2

2.1 Flowing through a steeper gradient ✓✓
River has a higher velocity therefore rate of erosion is high✓✓
River could be flowing on softer rock ✓✓
Higher rainfall ✓✓
River could have had a lower flow level ✓✓ [Any ONE] (1 x 2) (2)

2.2 River gravels ✓✓
Windgap/dry gap ✓✓
Waterfall ✓✓
Knickpoint ✓✓
Elbow of capture ✓✓ [Any TWO] (2 x 2) (4)

2.3 Very little water in a large valley ✓✓
Stream seems too small for the valley it occupies ✓✓
River deprived of headwater ✓✓ [Any ONE. Concept] (1 x 2) (2)

2.4 It has an increased volume of water ✓✓
The drainage basin increases ✓✓
More erosive power/energy ✓✓
The river could be rejuvenated ✓✓
Downward erosion at a faster rate ✓✓ [Any TWO] (2 x 2) (4)

2.5 Shortage of water downstream in the captured river (Kort River) ✓✓
Could affect farming activities along captured river (Kort River) ✓✓
Could affect fishing activities along captured river (Kort River) ✓✓
Less water for the generation of electricity ✓✓
Affect recreational activities because of less water in captured river (Kort River) ✓✓
Possibility of flooding along the captor stream/Berg River ✓✓
Excess water will wash away settlements and make it unsafe ✓✓

Cultivated land washed away (Berg River) ✓✓
Negative economic impact on farming (Kort River) ✓✓
After flooding fertile sediments deposited on flood plain (Berg River) ✓✓
Farming activities increase along the Berg River ✓✓
Positive impact on farming economy ✓✓

[Any SIX – Accept other reasonable answers. Must refer at least ONCE to the Kort River catchment or the Berg River]

[If listed and only words/phrases used, **ONE** mark. If full sentences used, **TWO** marks]
(6 x 2) (12)

QUESTION 3

3.1. C – Cutback/Undercut ✓✓
D – Slip off ✓✓ (2 x 2) (4)

3.2. Water flows slower ✓✓
Stream loses energy and cannot carry its load ✓✓
[Any ONE] (1 x 2) (2)

3.3 Fine soluble particles dissolve in water ✓✓and are transported as solution load ✓✓
Fine, insoluble is carried in suspension✓✓and is transported as suspension load ✓✓
Particles too heavy to be carried in suspension; (gravel, sand) is lifted and deposited ✓✓to bounce along as the saltation load ✓✓
Large stones and rocks are rolled along the riverbed ✓✓and are transported as the bed load / traction load ✓✓
[Refer to any ONE method of transportation] (2 x 2) (4)

3.4 Velocity increases; water can't negotiate the bend and river bursts its banks ✓✓
(1 x 2) (2)
[12]

TOPIC 1: FLUVIAL LANDFORMS, CATCHMENT AND RIVER MANAGEMENT, SLOPES AND MASS MOVEMENT

SOLUTIONS TO HOMEWORK

QUESTION 1:

1.1. Bulk movement of material down a slope under the influence of gravity ✓✓
[Concept] (1 x 2) (2)

1.2. (i) = Q ✓✓
Reason: Slope is gentle ✓✓
Slow movement ✓✓ [Any ONE reason]
(ii) = P ✓✓
Reason: Slope is steep ✓✓
Fast movement ✓✓ [Any ONE reason] (4 x 2) (8)

1.3. P: Scarp ✓✓
Q: Dip ✓✓ (2 x 2) (4)

1.4. Speed of the movement of materials down the slope ✓✓
Volume / quantity of material moving down the slope ✓✓
[Any ONE] (1 x 2) (2)

1.5. **Man's contribution:**
Deforestation destabilises slope ✓✓
Cultivation on slopes destabilises slope ✓✓
Non-engineered construction of roads / railways loosens rock particles ✓✓
Obstructing natural drainage increases water in soil ✓✓
Improper drainage increases water in soil ✓✓
Mining and quarrying loosen the rock particles ✓✓

Economic consequences:
Destruction of settlements ✓✓
Destruction of infrastructure ✓✓
Railway line blocked ✓✓
Goods cannot be transported ✓✓
Destruction of cultivated lands ✓✓
Expensive to rebuild ✓✓
Loss of property ✓✓

Measures:
Concrete spraying on slopes ✓✓
Building tunnel roofs ✓✓
Wire mesh ✓✓
Gabians (building of retaining walls) ✓✓
Drilling of bolts into the side of slopes to stabilise slopes ✓✓

Cause artificial rockfalls to clear debris ✓✓
Reforestation or revegetation ✓✓
Putting up wire nets to catch falling rock particles ✓✓
Mapping of landslide hazards ✓✓
Guidelines for planning human settlements and infrastructure ✓✓
Landslide disaster management strategies ✓✓
Avoid developing settlements on slopes ✓✓
No cultivation on slopes ✓✓ (6 x 2) (12)

[Must make at least ONE reference to each of the THREE aspects.]
Single marks only if answered in point form and not in paragraph /essay style]
[28]

QUESTION 2

2.1 Horizontal ✓✓
2.2 Cliff ✓✓
2.3 Resistant ✓✓
2.4 Remains constant ✓✓
2.5 Wider ✓✓ (5 x 2) **[10]**

TOPIC 2: MAP CALCULATION

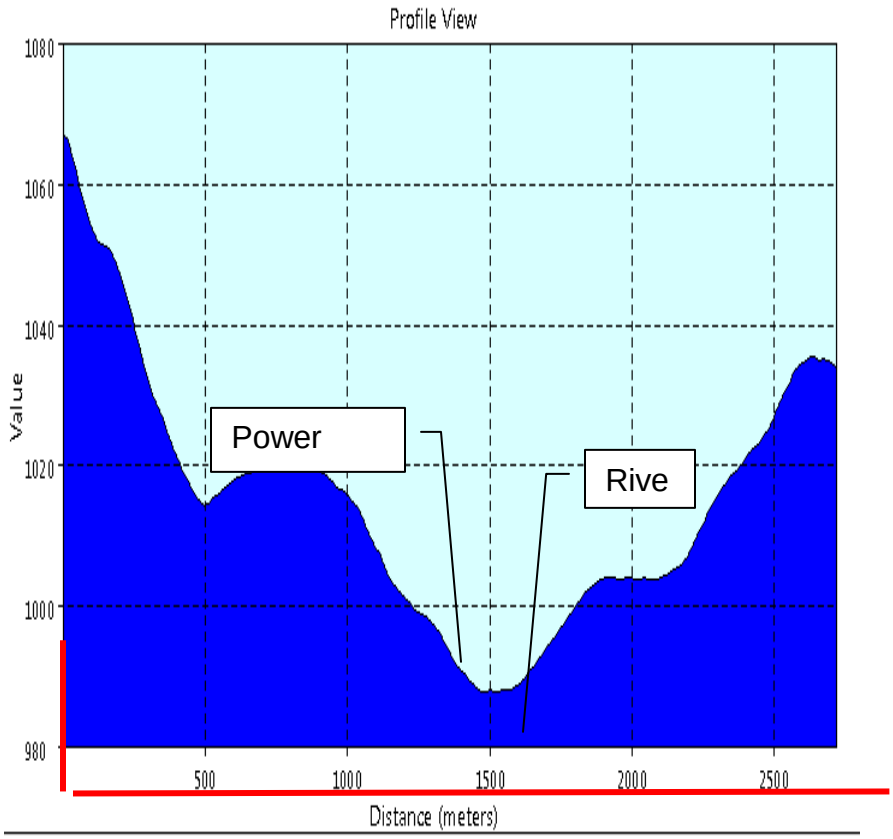
SOLUTIONS TO HOMEWORK

QUESTION 1

1.1 Length = 4cm x 0.5
= 2km✓
Breadth = 3.5cm x 0.5
= 1.75km✓
Area = L x B✓
= 2km x 1.75km
= 3.5km²✓ (4)

1.2 Height difference: 1046m – 978m = 68m✓
Distance = 3.3cm x 500
1650m✓
Gradient = $\frac{\text{Height}}{\text{Distance}}$ ✓
= $\frac{68m \div 68}{1650m \div 68}$ ✓
= 1/ 24.2✓ (5)

1.3.1. The shape must be the same but the size may differ.



Indicate vertical and horizontal scales ✓✓

Shape ✓✓✓✓✓✓ (8)

1.3.2. $VE = \frac{VS}{HS}$ ✓

$= \frac{\frac{1}{2\,000}}{\frac{1}{50\,000}}$ ✓

$= \frac{1}{2\,000} \times \frac{50\,000}{1}$ ✓

= The vertical scale is 25 times larger than the horizontal scale✓ (4)

1.3.3. Mark on cross section – position or road and power line ✓✓ (2)

1.3.4. It is a pass through a ridge✓ (1)

1.3.5. It is the lowest pass through a mountain and the road can stay more level than when it goes over the ridge. ✓✓ (2)

[26]

TOPIC 1: STRUCTURAL LAND FORMS

SOLUTIONS TO HOMEWORK

QUESTION 1

1.1 Homoclinal ridges / cuestas ✓✓ (1 x 2) (2)

1.2 Sedimentary rock that is tilted ✓✓
Softer layers will erode faster to form valleys ✓✓
Resistant layers will erode slower and protrude as ridges ✓✓
Tectonic activity (faulting / folding) causes sedimentary rock to move past one another ✓✓
As a result resistant layers will protrude above the surface ✓✓
[Any THREE] (3 x 2) (6)

1.3 Trellis ✓✓ (1 x 2) (2)

1.4 Ridges and valleys are parallel ✓✓
Alternating resistant and soft rock layers ✓✓
Therefore, main streams flow parallel to each other ✓✓
Short tributaries flow down the ridges and meet main streams ✓✓
Tributaries join main stream at right angles ✓✓[Any THREE] (3 x 2) (6)

[16]

QUESTION 2

2.1 E – Homoclinal ridge / Cuesta ✓✓
F – Mesa ✓✓ (2 x 2) (4)

2.2 E tilted more in relation to the earth's surface ✓✓
E has two steep slopes ✓✓
F has similar slopes on either side ✓✓
E developed in inclined rock ✓✓
F developed in horizontal strata✓✓ [Any ONE] (1 x 2) (2)

2.3 Of strategic importance – defensibility ✓✓
Soft layers between ridges form fertile soil suitable for agriculture ✓✓
If formed around basin shaped features, it could trap ground water ✓✓
Steep slopes afforested ✓✓ [Any TWO. Accept other] (2 x 2) (4)

[10]

QUESTION 3

3.1 B ✓✓
3.2 A ✓✓
3.3 D ✓✓
3.4 B ✓✓
3.5 C ✓✓ (5 x 2) **[10]**

QUESTION 4

4.1 (a) Cuesta/Homoclinal ridge ✓✓ (1 x 2) (2)

(b) Was used during war to protect settlements ✓✓
Fertile plains are found between these ridges which are used for agriculture ✓✓
Water traps which act as artesian basins ✓✓ [Any ONE] (1 x 2) (2)

(c) It forms in an area which has inclined strata/layers ✓✓
Alternate hard and soft strata ✓✓
The soft rock gets eroded forming valleys ✓✓
Hard rock protrudes above the surface as a cuesta/Homoclinal ridge ✓✓
[Any THREE] (3 x 2) (6)

4.2 B – dip slope ✓✓
C – scarp slope ✓✓ (2 x 2) (4)

4.3 Mesas form in horizontal strata ✓✓/ Mesas do not form in inclined strata ✓✓ (1 x 2) (2)

[16]

TOPIC 2: MAP INTERPRETATION

SOLUTIONS TO HOMEWORK

QUESTION 1

1.1.1 Dendritic ✓✓ (1 x 2) (2)

1.1.2. Uniform rock strata – similar resistance to erosion ✓✓
(All igneous or all sedimentary or all metamorphic) ✓✓ (1 x 2) (2)

1.1.3 It looks like a tree trunk with branches ✓✓
The tributaries join the main stream at acute angles. ✓✓ (2 x 2) (4)

1.1.4 The tributaries will flow nearly parallel to each other ✓✓
The tributaries will be longer ✓✓
Tributaries will join the main stream at an even more acute angle. ✓✓ (1 x 2) (2)

1.2.1 Third order stream ✓✓ (1 x 2) (2)

1.2.2 Valley ✓✓ (1 x 2) (2)

1.3.1 Semi dry ✓✓ (1 x 2) (2)

1.3.2 Non perennial rivers (1 x 2) (2)

1.4.1. Periodic river ✓✓ (1 x 2) (2)

1.4.2 Flow during the rainy season ✓✓
Get water from base flow and direct runoff during rainy season ✓✓
Get no water during dry season – water table below stream channel ✓✓ (3 x 2) (6)

[26]