TELEMATICS 2015

GEOGRAPHY

Grade 11
GEOGRAPHICAL MAPWORK SKILLS AND TECHNIQUES

1 CONTOURS AND SLOPES

- Contour lines join places with the same height above sea level.
- Contours far apart show a gentle slope.
- Contours close together show a steep slope

1.1 Concave slope

1.2 Convex slope

1.3 Terraced slope
3318DB PAARL

18° E   19° E

33° S

A  B  A  B
A  B  A  B
C  D  C  D
A  B  A  B
C  D  C  D

34° S

3  LOCATION IN DEGREES, MINUTES AND SECONDS

1° = 60'
1' = 60"

26° 45' 12" S; 29° 00' 41" E
26° 46' S; 29° 01' E
4 INTERVISIBILITY

The following methods can be employed in determining the direction of river flow.

5 DIRECTION OF RIVER FLOW

The following methods can be employed in determining the direction of river flow.
READ AND INTERPRETATION OF MAPS AND ORTOPHOTOS
The goal of this guide is to empower you with regard to the answer of interpretation questions in mapwork. Remember that there is a large amount of information on the topographical- and ortophoto map. To answer these questions successfully, you must know what to look at to get to the answer. Most of these questions come from previous exam question papers. Other questions have also been included. Remember that this is not a memorandum which has been given with the questions, but an attempt to show what you should look at to get to the answers. It is important to take note that ALL content, modules and skills can be assessed in the mapwork paper. Use this guide to study and prepare yourself for the mapwork question paper (Paper 2).

**CLIMATOLOGY**

1. *Does the area receive seasonal rainfall or rainfall throughout the year?*
   - Seasonal: Non-perennial rivers/ dams/ cultivated lands near rivers/ irrigation/ furrows

2. *Which slope is the warmest?*
   - The northward-facing slope – identify the northward-facing slope

3. *In which direction will an airplane take off and land?* (Remember that airplanes take off and land against the wind.)

**GEOMORPHOLOGY**

1. *Physical aspects influencing the construction of railways and roads.*
   - Mountains/ steep slopes/ marshes/ rivers/

2. *In which direction does the river flow?*
   - To the sea
   - Always from high to low
   - Contours bend upstream
   - Dam wall on downstream side
   - Tributaries join at acute angles

3. *Identify the landforms regarding structural landscapes:*
   - Horizontal layers: Mesas/ buttes/ conical hills
   - Inclined layers: dip and escarp slopes
   - Massive igneous rocks: dome-shaped landforms

4. *In which direction do the layers dip?*
   - Layers always dip in the direction of the GRADUAL slope

**ENVIRONMENTAL STUDIES AND SUSTAINABILITY**

1. *Evidence of nature conservation*
   - Nature reserve/ hiking trail/ fire break/ game reserve

2. *Evidence of conservational farming.*
   - Anti-erosion walls/ camps/ rows of trees to reduce wind/ contour ploughing

3. *Are there sources of air pollution in the area??*
   - Air pollution: Industries
   - Noise pollution: Airport
   - Water pollution: Factories / camping sites/ Power station near river

**ECONOMIC GEOGRAPHY**

(a) **PRIMARY ACTIVITIES (FARMING / MINING)**

1. *Commercial or subsistence farming?*
   - Commercial: Good infrastructure/ irrigation/ large farms/ farm names/ cellar/ dipping tank/ experimental farm/ estate/ sugar mill/ service rail/ abattoir/ dairy
   - Subsistence: Few roads/ footpaths/ no power lines/ small patches of cultivated land
2 Describe factors that advantage/disadvantage farming activities
   Advantage: Rivers/ dams/ flat land/ power lines/ railway lines
   Disadvantage: Steep slopes/ water scarce/ marshes

3 Identify mining activities
   Excavations/ mine dump/ conveyor belt/ terraces/ names of mines/ old mines/ subsiding ground

4 Identifying of fishing activities
   Fishing harbours/ fishermen’s houses/ factories near coast

5 Identifying of forestry
   Trees/ woodlands/ saw mill/ lookout towers/ fire break/ state forest

(b) SECONDARY ACTIVITIES (INDUSTRIES)

1 Describe the factors that influenced the location of the industries
   Flat surface/ raw material/ Transport(name the types)/ power (power station, power lines, coal mines)/ water/ labour(residential areas)/ Market/ outskirts/

2 Heavy or light industries?
   Heavy: Far from CBD/ railway transport/ Raw material-mining/ large spaces/
   Light: close to CBD / road transport/ raw material - farming

(c) TERTIARY ACTIVITIES (SERVICES)

1 Tourist attractions, holiday resorts, camping sites
   Close to beaches/ close to road railway/ wine tasting/ historical buildings/ monuments/ museums

2 Types of services found
   Electricity supply/ telephone/ medical/ pot office/ education(school/ college/ university) transport (roads airport railway)/ police services etc. (buildings on map)

3 Recreation facilities?
   Golf course/ athletics/ rifle range/ racing track/ etc

4 Factors that determined the location of the airport
   Flat area/ far from built-up area for safety/ noise/ roads/

5 Does the railway line and the road follow the same routes? Why not?
   The same? NB influence of topography
   Road: through mountain pass . Railway around mountain (between Paarl and Worcester)

6 For what is the dam on the map used? Give reasons
   Drinking water: Water purification works
   Irrigation: cannels and furrows
   Recreation: Yacht club, Hotels at dam, camping site, caravan park, slipway, etc.

SETTLEMENT

1 Why is the settlement located there?
   Flat area/ roads/ river/ mountain/ sea/ etc

2 Is it an urban or a rural settlement?
   Rural: Primary activities
   Urban: Secondary and Tertiary activities
MENTAL IMAGE OF THE MAP (RDISE)

RELIEF (Brown)
- Steep/gradual: Where?
- Height: Look at contours, spot heights, trig stations, bench marks, highest, lowest part of map

DRAINAGE (Blue)
- DAMS: Few or many
- Dams used for?
  - Irrigation (Canals & furrows)
  - Drinking water (Filtering plant)
  - Recreation (Yacht club, hotel)
- Rivers: Perennial or non-perennial?
- What does it tell us about the Climate?
- Ocean / lake
- Relationship between BROWN & BLUE

INFRASTRUCTURE (Red & Black)
- Types of roads
  - Do they follow the same route
- Types of railways
  - Why / why not
- Relationship with BROWN & BLUE

SETTLEMENTS (Grey & Black)
- Where? How many?
- Shape of settlement: Linier, Stellar, Round?
- Site of settlement
- Street patterns, Land use zones

AGRICULTURE & FORESTRY (GREEN)
- Type of farming
- Where
- Relationship of GREEN with BROWN, BLUE, RED, GREY
- Is there GREEN on steep slopes?
- Rows of trees-purpose?
- Woodlands
- Conservation?

OTHER PRIMARY
- Mining
- Fishing

SECONDARY
- Heavy or light
- Localisation

TERTIARY
- Water supply
- Electricity supply
- Other
CALCULATIONS

1. DISTANCE

FORMULA: Distance = \(\text{Map distance} \times \frac{\text{Scale}}{100 000}\)

Calculate the length of the national road from A to B.

\[\text{Distance} = 4.8 \text{ cm} \times \frac{50 000}{100 000} = 2.4 \text{ km}\]

2. AREA

FORMULA: AREA = Length \times Breadth

Calculate the area of Block X.

\[\text{Length} = \frac{5 \text{ cm} \times 50 000}{100 000} = 2.5 \text{ km}\]
\[\text{Breadth} = \frac{3 \text{ cm} \times 50 000}{100 000} = 1.5 \text{ km}\]
3. **GRADIENT**

**FORMULA:** Gradient = \( \frac{\text{VI (Difference in height)}}{\text{HE (Horizontal distance)}} \)

Calculate the gradient from C to D.

\[ \text{Gradient} = \frac{220 \text{m}}{2400 \text{m}} \]

\[ = \frac{1}{120} \]

\[ = 1:120 \]

4. **MAGNETIC DECLINATION AND MAGNETIC BEARING**

Magnetic declination is the difference between true North and magnetic North (on compass).

**NB The following when you work with Magnetic Declination**

1. What is the mean mag. declination (in degrees & minutes)?
2. In which direction is the magnetic declination?
3. In which year is the magnetic declination given?
4. What is the mean annual change?
5. In what direction is the average yearly change?
6. For what year must the mag. declination be calculated?
Mean magnetic declination 23° 53’ West of true north (Julie 2002).
Mean annual change 6° Westwards.

Calculate magnetic declination for 2009.

**STEP 1**
Calculate difference in years

2009 – 2002
= 7 years

**STEP 2**
Calculate total change

6’ x 7 years
= 42’ West

23° 53’ + 42’ = 23° 95’

**STEP 3**
Add or subtract from magnetic declination

STEP 3 NB: FOR SOUTH AFRICA
If the change is towards the WEST, it is **ADDED**.
If the change is towards the EAST, it is **SUBTRACTED**

23° 95’ = 24° 35’ West

**STEP 4**
Remember: Minutes cannot be more than 60!

5 VERTICAL EXAGGERATION

**FORMULA:**

\[
VE = \frac{\text{VERTICAL SCALE}}{\text{HORIZONTAL SCALE}}
\]

Calculate the vertical exaggeration of the following

**STEP 1**
Convert VS to ratio scale

4mm = 20m
4mm = 20 000mm (same units)
4 : 20 000
1 : 5 000

**STEP 2**
Place in formula

\[
\frac{1}{5000} \div \frac{1}{50000}
\]

= \[ \begin{array}{c}
1 \\
5000 \\
\times \\
5000 \\
\end{array} \]

= 10 Times