**NATIONAL
SENIOR CERTIFICATE**

**GRADE 11**

**NOVEMBER 2015**

**GEOGRAPHY P2
MEMORANDUM**

**MARKS:    75**

This memorandum consists of 10 pages.

**SECTION A**

**QUESTION 1:  MULTIPLE-CHOICE QUESTIONS**

The following statements are based on the 1 : 50 000 topographic map
2827DD FICKSBURG, as well as the orthophoto map of a part of the mapped
area.  Various options are provided as possible answers to the following
statements.  Choose the correct answer and write only the letter (A–D) in the
block next to the statement.

1.1    The natural feature that forms the international boundary labelled **J**, in
       block **H4**, on the topographic map of Ficksburg is a …

       A    mountain range.
       B    road.
       C    river.
       D    railway line.

       **C**

1.2    The international boundary found on the topographic map is
       between …

       A    South Africa and Swaziland.
       B    South Africa and Lesotho.
       C    South Africa and Mozambique.
       D    South Africa and Botswana.

       **B**

1.3    An orthophoto map is a ... aerial photograph which has contour lines and
       other labelled features drawn onto it.

       A    high oblique
       B    low oblique
       C    horizontal
       D    vertical

       **D**

1.4    The topographic map number **2827** refers to the …

       A    longitude and latitude.
       B    latitude and longitude.
       C    contour lines and isobars.
       D    longitude and contour lines.

       **B**

1.5    The feature labelled **1** on the orthophoto map is a ...

       A    spur.
       B    valley.
       C    saddle.
       D    butte.

       **A**

Please turn over

1.6    The type of slope labelled **2** on the orthophoto map is a … slope.

     A     terraced
     B     gentle
     C     steep
     D     concave

| **C** |
|-------|

1.7    The man-made water feature at 28°49'20''S  28°49,33'S / 27°56'55''E 27°56,9'E on the topographic map is a …

     A     non-perennial river.
     B     windmill.
     C     dam.
     D     river.

| **C** |
|-------|

1.8    The ratio scale of the orthophoto map indicates that 1 cm on the map represents … on the ground.

     A     0,01 km
     B     0,1 km
     C     10 km
     D     1 km

| **B** |
|-------|

1.9    The approximate time that the orthophoto was taken would be ...

     A     between 06:00–08:00.
     B     between 10:00–12:00.
     C     between 14:00–16:00.
     D     after 17:00.

| **B** |
|-------|

1.10   The building marked **3** on the orthophoto map is a …

     A     school.
     B     factory.
     C     silo.
     D     smallholding.

| **A** |
|-------|

1.11   Ficksburg is located in the …

     A     Northern Cape.
     B     Eastern Cape.
     C     Free State.
     D     Western Cape.

| **C** |
|-------|

1.12   Evidence to prove that ground water, in block **G3**, is used around Ficksburg for agricultural purposes is the occurrence of …

     A     rivers.
     B     dams.
     C     furrows.
     D     windpumps.

| **D** |
|-------|

1.13   What primary activity is found at **4** on the orthophoto map?

   A    Excavation/Diggings
   B    Orchards and vineyards
   C    Mining
   D    Fishing

<div style="border:1px solid black; display:inline-block; padding:4px 16px"><strong>A</strong></div>

1.14   The man-made feature marked **5** on the orthophoto map is a …

   A    dam wall.
   B    river.
   C    bridge.
   D    silo.

<div style="border:1px solid black; display:inline-block; padding:4px 16px"><strong>D</strong></div>

1.15   The reference number of the orthophoto map directly north-east of
       Ficksburg is ...

   A    2827 DD 14.
   B    2827 DD 9.
   C    2827 DD 12.
   D    2827 DD 8.

<div style="border:1px solid black; display:inline-block; padding:4px 16px"><strong>B</strong></div>

(15 x 1)   **[15]**

**SECTION B**

**QUESTION 2: MAPWORK TECHNIQUES AND CALCULATIONS**

Consult the topographic map and answer the following questions. You may use the orthophoto map.

2.1      Calculate the length of the rifle range in block **D4** on the topographic map in metres.
Show ALL calculations. Marks will be awarded for calculations.

Distance = Distance on a map x scale / DM x S
                            100

         = (0,8 cm ✓/ x 500)   /    (Accept any units e.g.)
                                 Range (0,7 – 0,9 cm) / (7 mm – 9 mm)
         = 400 m ✓

                         (Range 350 m – 450 m)

   **NOTE:** (No units – no marks for final answer.)

                                                 (2 x 1)    (2)

2.2      Locate the caravan park, in block **E3,** on the topographic map. You decide to walk from the caravan park, to trigonometrical beacon Δ338, in block **E4**.

     2.2.1   Will your walk be *easy* **or** *difficult*? Explain your answer.

            Difficult ✓– Steep gradient because the contour lines are close
                       together. ✓

                                                 (2 x 1)    (2)

     2.2.2   Having completed the walk, calculate the vertical exaggeration for a cross-section drawn on a topographic map with a vertical scale of 1 cm to represent 20 m. Show ALL calculations. Marks will be awarded for calculations.

| VE = VS/HS ✓ | VE = VS/HS ✓ |
|---|---|
| = 1/2 000 ✓ ÷ 1/50 000 ✓ | = 1/20 ✓ ÷ 1/500 ✓ |
| **OR** | |
| = 1/2 000 x 50 000/1 ✓ | = 1/20 x 500/1 ✓ |
| = 25 times ✓ | = 25 times ✓ |

           **NOTE:** [No units – no marks for final answer]

                                                 (5 x 1)    (5)

2.3   Calculate the magnetic declination for the year 2015.
Show ALL calculations. Marks will be awarded for calculations.

Difference in years    = 2015 – 2010
                             = 5 years ✓

Mean annual change = 5 x (4' W )✓
                             = 20' W ✓

MD for 2015          = 21° 54'
                       + ✓<u>20'</u>
                    22° 14' W ✓

**NOTE:** (No mark for the question if units are not included.)

                                                      (5 x 1)    (5)

2.4   Calculate the area of block **E5** in km$^2$ on the topographic map.
Show ALL calculations. Marks will be awarded for calculations.

Measurement range: length   –  3,6 cm to 3,8 cm / 36 mm to 38 mm
                      breadth  –  3,1 cm to 3,3 cm / 31 mm to 33 mm
                           (Accept any units)

Area = length x breadth

= (3,7 cm ✓ x 0,5) km x (3,2 cm ✓ x 0,5)
**NOTE:** (Allocation of marks for correct measurement.)

= 1,85 km ✓ x 1,6 km ✓        (1,8 km to 1,9 km x 1,55 km to 1,65 km)

= 29,6 km² ✓
                           (Range is 2,76 km² to 3,16 km²)
**NOTE:** (Final answer in km²)

                                                      (5 x 1)    (5)

2.5   What is the average elevation of the Ficksburg Aerodrome, in block **B7**?
(No marks if final answer has no units.)

1 620 m ✓
                           (Range 1 615 m – 1 630 m)
**NOTE:** (Final answer in metres.)

                                                      (1 x 1)    (1)
                                                          **[20]**

**SECTION C**

**QUESTION 3: MAP INTERPRETATION AND ANALYSIS**

3.1 Give TWO pieces of evidence from the topographic map which indicate that farmers in Ficksburg practice irrigation, in block **A9/10** and **B9/10**.

Numerous small dams ✓✓
Presence of wind pumps ✓✓
Boreholes ✓✓
Cultivation of land next to rivers ✓✓
Reservoirs ✓✓
(Any TWO)

(2 x 2) (4)

3.2 Mass movements can be classified according to the speed of movement and the amount of water necessary to assist the movement.

3.2.1 Name TWO types of mass movement the slopes at **2** on the orthophoto map could experience.

Soil creep ✓
Rock falls ✓
Landslides ✓
Earthflow ✓
Mudflow ✓
(Any TWO)

(2 x 1) (2)

3.2.2 Describe TWO strategies that Spoornet (railway) could do to minimise the effect of mass movement identified in QUESTION 3.2.1 above.

Careful management:
Slope angle/geology considered ✓✓
Vegetation on slope ✓✓
Cuttings with concrete ✓✓
Drainage ✓✓
Catch fences and concrete canopies ✓✓
(Any TWO. Accept other logical answers.)

(2 x 2) (4)

3.3 The mountains in the area of the topographic map are all similar in shape and height.

    3.3.1 Sketch a side view (profile) of the mountain, along the line marked **P–Q** in block **A7** and **A8** to illustrate the typical shape of the mountains and their slope elements.
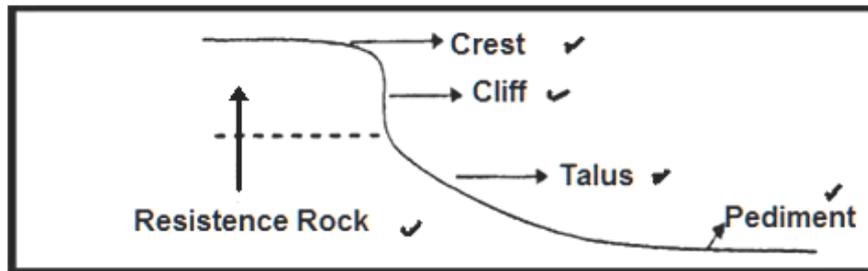


Sketch: 1 mark – flat top✓
            1 mark – concave slope ✓

                                                               (2 x 1)     (2)

    3.3.2 Label your diagram to show the four slope elements.

                                                                (4 x 1)     (4)

    3.3.3 On the sketch, indicate the position of the resistant horizontal layer of rock.

                                                                   (1 x 1)     (1)

3.4 Using evidence from the map, outline TWO challenges the rural women living in huts, in block **H7**, could experience.

Collecting water ✓✓
Collecting firewood ✓✓
Lack of transport to Ficksburg – shops ✓✓
(Any TWO – Accept other reasonable responses.)

                                                                (2 x 2)     (4)

3.6 Give TWO possible reasons why people from the neighbouring country might visit Ficksburg.

Recreation/(or examples of recreation) ✓✓
Shopping ✓✓
Medical services ✓✓
For employment opportunities ✓✓
(Any TWO. Accept other reasonable responses.)

                                                                (2 x 2)     (4)
                                                                   **[25]**

**SECTION D**

**QUESTION 4:  GEOGRAPHICAL INFORMATION SYSTEMS (GIS)**

4.1  What is the term used to describe the conversion of a paper map to be used in a computer?

GIS ✓

                                                    (1 x 1)     (1)

4.2  Differentiate between *vector* and *raster data*.

**Vector:**  Uses points, lines and areas inside a polygon to define data stored in a computer. ✓

**Raster:**  Each area is divided into rectangular grid cells and each rectangular cell contains an attribute value and its location coordinates. ✓
(Concepts)

                                                    (2 x 1)     (2)

4.3  Answer the following questions on *data layering*:

4.3.1  Explain the meaning of the term *data layering* in GIS.

Maps showing different types of information are projected onto one another/placed on top of one another. ✓
(Concept)

                                                    (1 x 1)     (1)

4.3.2  Using GIS technology, a farmer in Ficksburg can combine certain overlays to gain an entire spatial database of his farm. This could help him to make informed decisions about the layout of the farm. Suggest THREE overlays that the farmer in block **B11** could use.

Infrastructure e.g. road/railway/transport ✓
Topography e.g. relief/contours/hill/soil type ✓
Drainage e.g. dam/river ✓
Farming e.g. cultivation ✓
Buildings ✓
(Any THREE of the above)

                                                    (3 x 1)     (3)

4.4  Two municipal officials from Ficksburg have to take photographs of the landscape. One has a 2,0 megapixel camera and the other has a 6,0 megapixel camera. The resolution of the photographs taken by the official will differ.

4.4.1  Explain the meaning of the term *resolution*.

It refers to the degree of detail and clarity of an image. ✓
(Concept)

                                                    (1 x 1)     (1)

4.4.2   Which of these cameras would give better quality pictures?
Explain your answer.

The one with 6.0 megapixels. ✓

It is a higher resolution camera. ✓✓
High definition/better definition. ✓✓
More square per unit area. ✓✓
Larger pixels resulting in clear view/image. ✓✓
(Any ONE of the above)

(1 + 2)    (3)

4.5   Define the term *attribute data*.

Refers to a descriptive quality or character. ✓
(Concept)

(1 x 1)    (1)

4.6   Identify a point feature, a polygon feature and a line feature in block **B9** on the topographic map.

**A point feature:**
Windpump ✓
Buildings ✓
Spot height ✓
(Any ONE)

**An area/polygon feature:**
Dam ✓
Cultivated land ✓
Orchard ✓
Erosion ✓
(Any ONE)

**A line feature:**
Other road ✓
Railway ✓
Contour lines ✓
River ✓
Dam wall ✓
Farm boundary ✓
Row of trees ✓
Hiking trail ✓
Pipeline ✓
(Any ONE)

(3 x 1)    (3)
**[15]**

**TOTAL:    75**