UNIVERSITY OF SWAZILAND

DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND PLANNING

B. ED SEC II, B.SC. II, BA. Hum II, & BA. SOC. SC. II

FACULTY OF SCIENCE

SUPPLEMENTARY EXAMINATION JULY, 2008

B.Sc. II,

TITLE OF PAPER	:	ELEMENTARY SURVEYING AND CARTOGRAPHY
COURSE NUMBER	:	GEP 213
TIME ALLOWED	:	THREE (3) HOURS
INSTRUCTIONS	:	ANSWER ANY THREE (3) QUESTIONS INCLUDING QUESTION ONE (1) WHICH IS COMPULSARY.
ALLOCATION OF MARKS:		QUESTION ONE CARRIES FOURTY (40) MARKS AND THE OTHER QUESTIONS CARRY THIRTY (30) MARKS EACH.

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SECTION I: COMPULSORY

QUESTION 1

a) i. What are the three (3) statements of scale that can be employed in cartography to draw any given map? **(6 marks)**

ii. Which statement of scale was used to produce the map in Figure 1? **(3 marks)**

b) i. Name the three categories which could be used for the classification of maps. **[9 marks)**

ii. Use the table on page 2 to classify the maps stated below using each of the three (3) categories of map classification stated in (i) above. **(12 marks)**

- A **National topographic map of Swaziland** with scale 1:1000 000
- A **Topographic map of Swaziland** Sheet 2631 CA (PWD N0.17) of scale 1: 50 000.
- An **Orthophoto map** of the Central Rural Development Area (Luyengo sheet N0. AM 15) with a scale of 1:5000.
- A **geology map of Swaziland** with a scale of 1:25000.

c) In not more than ten lines (10) describe the surveying process, clearly stating the three stages involved in it. **(10 marks)**

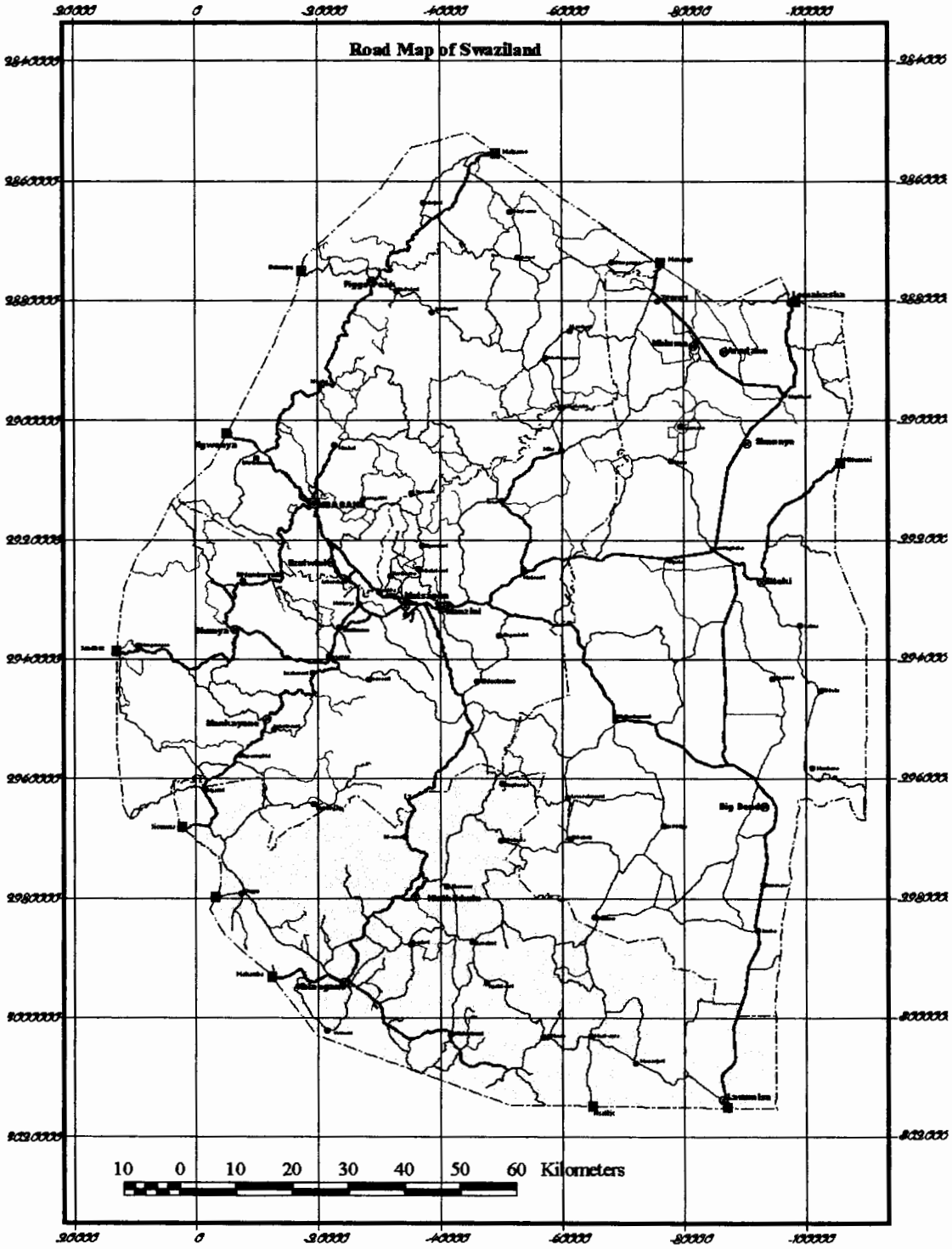

Figure 1. Map of Swaziland Showing Tinkhundla Constituencies

EXAMINATION N0.:.....

Map Name	Map Scale	Classification Category								

SECTION II: ANSWER ANY TWO QUESTIONS

QUESTION 2

a) i. Name any two (2) methods that could be used to compute areas from maps other than the grid method. **(2 marks)**

ii. State any two limitations of the grid method as a means of area estimation. **(6 marks)**

b) i. An area of a farm on a map of scale 1:50 000 was estimated using a 1 cm^2 grid as 20.0 cm^2. Compute the true area of the farm in square meters and hectares. **(12 marks)**

ii. Describe in detail how you could use the grid method to estimate the area of a given farm shown on a scaled map. **(10 marks)**

QUESTION 3

a) During the setting-out of a botanical garden , the site in question had to be leveled. To do this a topographic survey of 30 m x 30 m was conducted in an attempt to provide the required contour map from which a formation depth of 1.5 m was determined. The sum of N (the number of times the reduced level has been used) was computed as 40.0, while the total height of the reduced level multiplied by N was 4840.0 m. Compute the following:

i. Mean height. **(5 marks)**

ii. Depth of excavation. **(5 marks)**

iii. Volume of excavation. **(5 marks)**

iv. If the company doing the work had one 200 m^3 capacity truck, how many times was the truck going to transport the earth removed from the site? **(5 marks)**

b) i. Name the method of contouring that was employed to collect the data referred to in (a) above. **(4 mark)**

ii. State briefly the uses of contour maps. **(6 marks)**

QUESTION 4

a) Discuss briefly the role of lettering in modern cartography. **(5 marks)**

b) Briefly describe any three precautions that one has to take into account when using aerial photographs for any detailed interpretation exercise. **(6 marks)**

c) List the two important flight planning elements that are within the control of the client i.e. outside the pilot's control). **(2 marks)**

d) Name and discuss in detail the three (3) methods that could be used to determine the scale of any given set of aerial photographs. **(10 marks)**

e) In an attempt to determine a scale of an area on a set of aerial photographs, an environmentalist measured a distance of 6.0 mm between two road junctions on a topographic map on a scale of 1 : 25 000. The same distance measured 10.0 cm on the pair of aerial photographs.

i. Calculate the scale of the photograph and give your answer in a ratio form (1: n). **(4 marks)**

ii. If the intersection occurred at an average elevation of 380.0 m above sea level and the camera had a focal length of 209.0 mm, what was the flying height of the aircraft when these photographs were taken? **(3 marks)**

QUESTION 5

a) What are the four statements of scale that can be used for cartographic applications? **(8 marks)**

b) Which statement of scale was used on the map of Swaziland shown on Figure 1? **(2 marks)**

c) Calculate the scale factor (SF) given that the actual scale was 1:30 000 000 and the principal scale was 1:15 000 000. **(8 marks)**

d) Briefly discus the advantages of a map compared to a globe in modern cartography. **(12 marks)**