

UNIVERSITY OF SWAZILAND

DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND PLANNING

FINAL EXAMINATION : DECEMBER 2006
B.Sc. II

TITLE OF PAPER : ELEMENTARY SURVEYING AND CARTOGRAPHY

COURSE CODE : GEP 213

**INSTRUCTIONS: ANSWER THREE (3) QUESTIONS INCLUDING
QUESTION 1, WHICH IS COMPULSORY AND
ONE (1) QUESTION FROM EACH SECTION**

**MARKS ALLOCATION: QUESTION 1 CARRIES 40 MARKS. OTHER QUESTIONS
CARRY 30 MARKS EACH.**

**THIS QUESTION PAPER SHOULD NOT BE OPENED UNTIL PERMISSION HAS
BEEN GRANTED BY THE INVIGILATOR**

SECTION A: COMPULSORY QUESTION

QUESTION 1

- (a) Using relevant examples, compare and contrast mistakes and errors. (10 Marks)
- (b) A 30-m tape weighing 0.55kg and with a cross-sectional area of 0.02cm^2 was standardised and found to be 30.005m at 20°C , with 5-kg tension and supported at the 0 and 30-m points. This tape was used to measure a distance of about 89m over terrain of a uniform 5 per cent slope. The temperature was constant at 30°C , the tape was fully supported throughout, and tension of 5kg was applied to each tape length. The observed distances were 30.000m, 30.000m, and 29.500m. Calculate the horizontal distance between the points (taking into account the necessary corrections for systematic errors). (20 Marks)
- (c) A field measured with a 20-m chain was found to be 10 hectares. The chain was later found to be 19.7m long. What was the true area of the field? (10 Marks)
(40 marks)

SECTION B

ANSWER ANY ONE QUESTION FROM THIS SECTION

QUESTION 2

- (a) Write short notes on the following methods of making linear measurements:
- (i) Optical distance measurement; (5 Marks)
 - (ii) Electromagnetic and electro-optical distance measurement. (10 Marks)
- (b) On a plan of scale 1 in 600, the distance between two points was measured and found to be 428m. It was found afterwards that the scale used was 1 in 500. What was the true length? (10 Marks)

QUESTION 2 (continued)

- (c) Explain the problems you encountered using the Abney level during the practical on measuring distances in the vertical plane.

(5 Marks)
(30 marks)

QUESTION 3

- (a) Differentiate between direct and indirect methods of levelling. (5 Marks)
- (b) Explain the likely errors one would encounter in using an odometer for measuring distance on rough terrain.

(5 Marks)

- (c) Briefly explain **TWO** errors that can arise in each of the following and indicate how they can be minimised or eliminated:

- (i) Distance measurements using a tape; and (10 Marks)
- (ii) Levelling. (10 Marks)
- (30 Marks)

SECTION C

ANSWER ANY ONE QUESTION FROM THIS SECTION

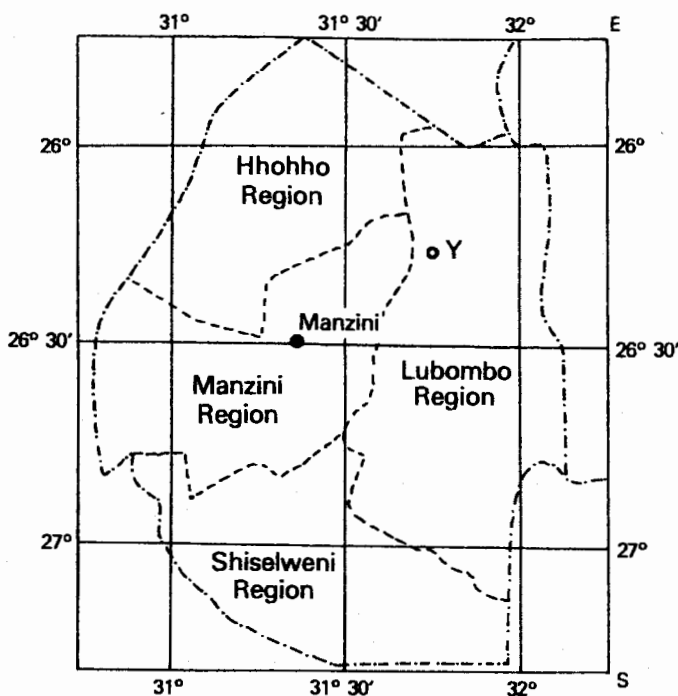
QUESTION 4

- (a) Is there any relationship between surveying and cartography? Explain your answer. (10 Marks)
- (b) The process of cartographic design can be divided into three stages. Explain each of these stages.

(20 Marks)
(30 marks)

QUESTION 5

- (a) Write short notes on the grid system of reference. (10 Marks)
- (b) Using the grid map of Swaziland below, write down the locations of the administrative regions of Swaziland. (10 Marks)



The Grid map of Swaziland

- (c) Write short notes on:
- (i) Geographic North Pole; and
 - (ii) Magnetic South Pole.
- (10 Marks)
(30 marks)