

UNIVERSITY OF SWAZILAND
DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND
PLANNING

FINAL EXAMINATION, DECEMBER 2016

B.A., BSc., BASS, B.Ed.

TITLE OF PAPER: INTRODUCTION TO ELEMENTARY
SURVEYING & CARTOGRAPHY

COURSE NUMBER: GEP211/GEP213

TIME ALLOWED: THREE (3) HOURS

INSTRUCTIONS:

- 1. ANSWER THREE QUESTIONS**
- 2. QUESTION 1 IS COMPULSORY**
- 3. ILLUSTRATE YOUR ANSWERS WITH**
EXAMPLES AND CLEARLY DRAWN DIAGRAMS
WHERE APPROPRIATE

ALLOCATION OF MARKS: QUESTION 1 (COMPULSORY) CARRIES
40 MARKS, WHILE THE REST CARRY
30 MARKS EACH

THIS PAPER SHOULD NOT BE OPENED UNTIL PERMISSION IS
GRANTED BY THE INVIGILATOR

**GEP211/GEP213 : INTRODUCTION TO ELEMENTARY SURVEYING &
CARTOGRAPHY- DECEMBER 2016**

SECTION A: COMPULSORY

Question 1

a) Define the following terms associated with levelling;

- i) Ordinance datum (2 marks)
- ii) Benchmark (2 marks)
- iii) Intermediate sight (2 marks)
- iv) Change point (2 marks)
- v) Reduced level (2 marks)

b) State the two methods used in levelling. (2 marks)

c) Using the data provided in the table below, use a method of your choice to undertake levelling for a site at UNISWA, Kwaluseni Campus. (20 marks)

Staff reading (m)			Distance (m)	Remarks
<i>Backsights</i>	<i>Intermediates</i>	<i>Foresights</i>		
0.70				B. M. (653.0 m)
	1.330		0	Staff station 1
	1.972		10	Staff station 2
0.521		2.295	20	Change point 3
	1.270		30	Staff station 4
	1.775		40	Staff station 5
0.492		2.191	50	Change point 6
	1.204		60	Staff station 7
	2.104		70	Staff station 8
		3.029	80	Staff station 9

d) For the selected method in part c), perform the arithmetic checks to ensure that the booking was accurate, showing the formulas and the working fully. (3 marks)

e) Discuss the common errors in levelling, and how these are eliminated or minimised. (5 marks)

(40 Marks)

SECTION B: ANSWER ANY TWO QUESTIONS

Question 2

Describe any three direct linear measurement methods used in surveying highlighting the advantages and disadvantages in each case.

(30 Marks)

Question 3

- a) Describe the basic characteristics of maps. (10 marks)
- b) Discuss the various uses of maps, giving specific examples in each case. (10 marks)
- c) Explain the three categories that are used to classify maps. (10 marks)

(30 Marks)

Question 4

- a) Describe how offsets are measured, and the three methods used to determine them during chaining. (10 marks)
- b) Discuss the sources of errors in chaining and how these can be minimized. (8 marks)
- c) As a surveyor, you were tasked with surveying a small holding farm in Sidvokodvo, and you opted to use the chaining technique to perform it. Chaining was performed using a tape measure marked 30m. On completing the task, the map of the farm was produced to a scale of 1:1000. Amongst the deliverables for the work were the straight-line distance from the farm gate to the farmhouse and the areal coverage of a dam within the farm. These were found to be 8 cm (distance), and 3.2 cm² (area of the dam) on the map, respectively.

However, later you discover that the tape measure you had used was 0.35m longer. To correct for the wrong measurements, your task now is to (showing all your working):

- i) Calculate the true length from the farm gate to the farmhouse. (3 marks)
- ii) Calculate the true area of the dam, presenting it in km² and hectares. (9 marks)

(30 Marks)

Question 5

Explain how any five visual variables can be used in making graphic elements appear more or less distinctive and prominent.

(30 Marks)