UNIVERSITY OF SWAZILAND

DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND PLANNING

FINAL EXAMINATION, DECEMBER 2015

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

TITLE OF PAPER: INTRODUCTION TO ELEMENTARY

                         SURVEYING & CARTOGRAPHY

COURSE NUMBER: GEP 213

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

GEP 213: INTRODUCTION TO SURVEYING & CARTOGRAPHY- DECEMBER 2015

SECTION A: COMPULSORY

Question 1

a) State any two height measurement methods.   (2 marks)

b) An area identified for a town development project on a map scale of 1:25 000 was estimated using a 1 cm^2 grid as 119.5 cm^2. What is the true area of the town development project in; (i) hectares   (4 marks)
       (ii) km^2 (4 marks)

c) Briefly describe the principal divisions or classifications of surveying, highlighting how they differ from each other.   (15 marks)

d) Given that the calculated area on a map scale of 1:4 500 was 3850 cm^2 and that the lengths were measured using a chain that was 4% longer.
   Calculate:
       (i) the true area in hectares.   (4 marks)
       (ii) the percentage error of the area.   (3 marks)

e) Outline the four conditions that an ideal distortion-free map must satisfy.
                    (8 marks)

                    [40 Marks]

SECTION B: ANSWER ANY TWO QUESTIONS

Question 2

a) 'The basic graphic elements can be made to appear more distinctive and prominent by employing visual variables'. Explain four primary visual variables. (20 marks)

b) Briefly explain the following classes of symbols.
   (i) Point-emphasising symbols   (5 marks)

   (ii) Line-emphasising symbols   (5 marks)

                    [30 Marks]

Question 3

a) Describe how the electromagnetic distance measurement instrument operates.

(10 marks)

b) A WILD dumpy level was used to measure a distance between two trees in a botanical garden. The upper stadia of the level read 2.031 m, while the lower stadia read 1.472 m.

   (i)   Calculate the distance between the two trees. (5 marks)

   (ii)   If these readings were correctly taken, what was the middle cross hair supposed to be?

(5 marks)

c) Define the following terms;
   - (i)   Map projection   (2 marks)
   - (ii)   Pace factor   (2 marks)
   - (iii) Photogrammetry   (2 marks)
   - (iv) Local attraction   (2 marks)
   - (v)   Horizontal line   (2 marks)

[30 Marks]

Question 4

a) Describe any two methods that are used in measuring areas of irregular shapes on maps.

(20 marks)

b) Outline the uses of GPS in surveying. (10 marks)

[30 Marks]

Question 5

a) Describe any two classes of map projection systems. (15 marks)

b) The length of a line measured with a 30 m tape was found to be 0.009 m shorter under the same conditions of support, tension and temperature as existed during the undertaking of the line measurement. Determine the actual length of the line. (5 marks)

c) Outline the sources of error in chaining, highlighting the precautions to be taken to minimize these errors. (10 marks)