

UNIVERSITY OF ESWATINI
DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND
PLANNING

FINAL EXAMINATION, DECEMBER 2018

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

TITLE OF PAPER: INTRODUCTION TO ELEMENTARY
SURVEYING & CARTOGRAPHY

COURSE NUMBER: GEP211

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: INTRODUCTION TO ELEMENTARY SURVEYING & CARTOGRAPHY -
DECEMBER 2018**

SECTION A: COMPULSORY

Question 1

- a) Define the following terms used in surveying;
- i) Surveying (2 marks)
 - ii) Collimation (2 marks)
 - iii) Temporary benchmark (2 marks)
 - iv) Geoid (2 marks)
 - v) Traverse (2 marks)

- b) Using the data provided in Table 1, correct for local attraction in the compass traverse survey. (12 marks)

Table 1: Bearings from a traverse survey

Line	Length (m)	Station	Bearings	
			Forward ($^\circ$)	Backward ($^\circ$)
AB	85.64	A	47.5	227.5
BC	83.2	B	86.5	266.5
CD	102.7	C	159.5	339.5
DE	104.29	D	252	72
EA	105.45	E	305.5	128

- c) For the corrected bearings in b) above, plot the survey using an appropriate scale, clearly showing all the steps, and state the scale used. (13 marks)
- d) If a compass traverse was undertaken, and it yielded the results in Figure 1, check if it is necessary to adjust the traverse. Show your working. (5 marks)

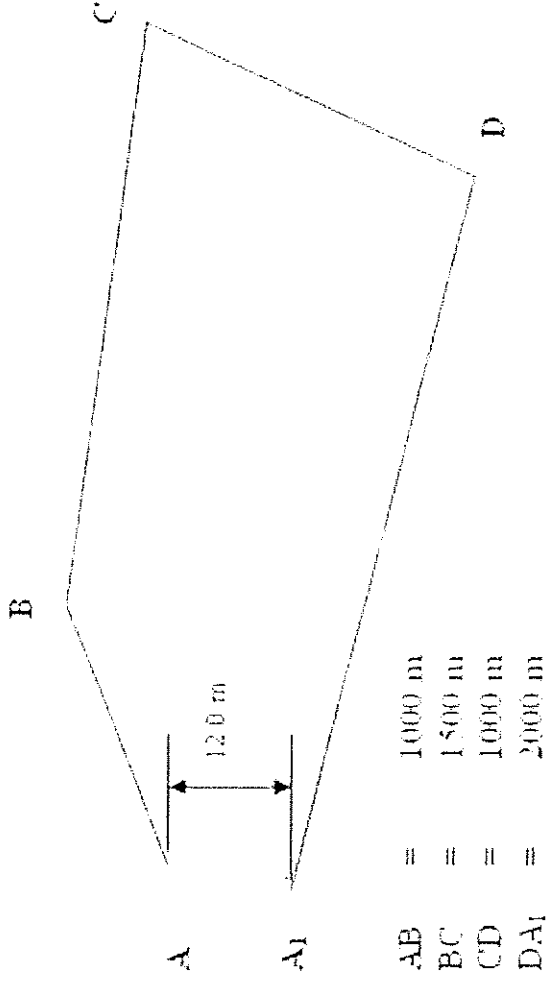


Figure 1: An open traverse that may need correction

(40 Marks)

SECTION B: ANSWER ANY TWO QUESTIONS

Question 2

- a) Using examples, discuss direct and indirect linear measurement techniques, and how they differ from each other. (12 marks)
- b) Outline the steps you would undertake and the computation you would perform to establish your pace factor. (4 marks)
- c) Assume that you are an agricultural extension officer with a pace factor of 0.6m, and you visited a farmer's crop field, where you made the measurements given in Table 2. Calculate the area you measured in the field, in hectares. (8 marks)

Table 2: Field measurements from a pacing survey

Rectangular field sides	AB	BC	CD	DA
Length (paces)	140	60	136.5	57

- d) Figure 2 is a surveyor's telescope. If this was reading between a survey station and a tree, what is the distance of the tree from the station? Show all your working. (6 marks)

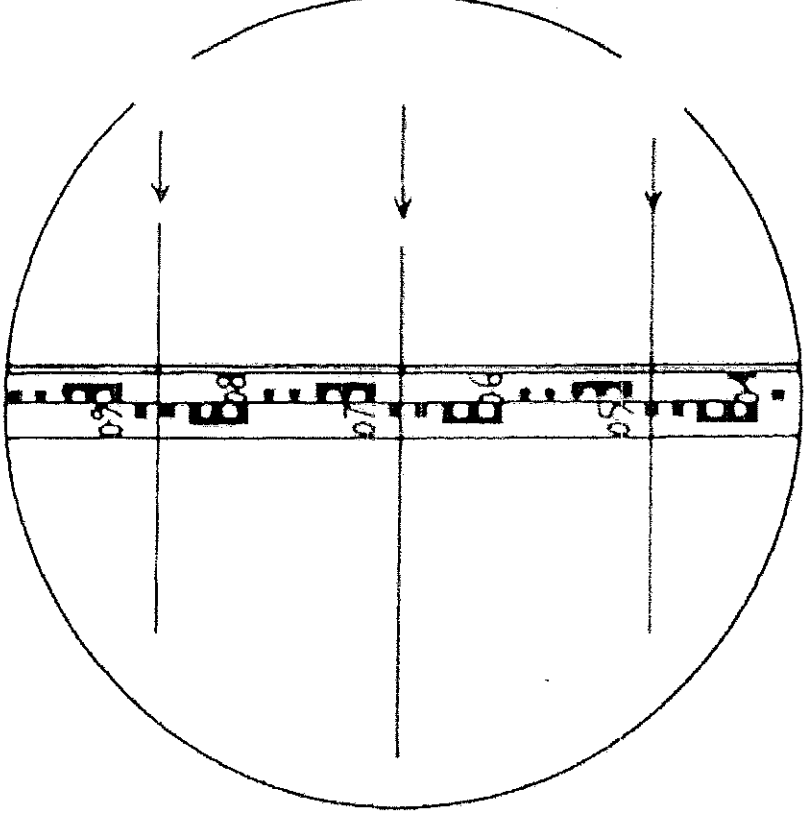


Figure 2: A surveyor's telescope

(30 Marks)

Question 3

- a) Define the following terms used in cartography:

- i) Thematic map (2 marks)
- ii) Graphic elements (2 marks)
- iii) Legibility (2 marks)
- iv) Area scale (2 marks)
- v) Map lettering (2 marks)

- b) Explain any five controls or external forces that influence map designing. (20 marks)

(30 Marks)

Question 4

- a) Discuss the inherent problems of globes that justify the wide use of map projections to produce conventional maps. (15 marks)
- b) Describe the principal divisions or classifications of surveying highlighting how they differ from each other. (15 marks)

(30 Marks)

Question 5

- a) Explain the following classes of symbols, highlighting two examples of uses in each case;
 - i) Line-emphasising symbols (5 marks)
 - ii) Area-emphasising symbols (5 marks)
- b) Describe the basic characteristics of maps. (10 marks)
- c) Discuss the general cartographic rules used for positioning lettering for the following;
 - i) Areal features (5 marks)
 - ii) Place features (5 marks)

(30 Marks)