

UNIVERSITY OF ESWATINI
DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND PLANNING

RE-SIT EXAMINATION, JANUARY 2020

B.A., B.Sc., BASS, B.Ed.

TITLE OF PAPER: ELEMENTARY SURVEYING & CARTOGRAPHY

COURSE NUMBER: GEP211

TIME ALLOWED: THREE (3) HOURS

INSTRUCTIONS: 1. ANSWER THREE QUESTIONS

- 1. QUESTION 1 IS COMPULSORY**
- 2. 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: ELEMENTARY SURVEYING & CARTOGRAPHY - JANUARY 2020**SECTION A: COMPULSORY****Question 1**

- a) Name any two methods of indirect linear distance measurement. (2 marks)
- b) A WILD dumpy level was used to measure a distance between two points in a construction site. The upper stadia of the level read 3.031m, while the lower stadia read 2.0454m.
- Calculate the distance between these two points. (5 marks)
 - If these readings were correctly taken, what was the middle cross hair supposed to be? (3 marks)
- c) A land use officer happens to visit an area that has been earmarked for construction of a school. While walking over the piece of land for construction, the officer notices that there are a few old graves in the area. The officer then decides to estimate the area covered by the gravesite, which they do by using a common measurement method, and the measurements are recorded in Table 1.

Table 1: Site measurements

Field side	AB	BC	CD	DA	AC
Paces	47	32	58	33	65

- What is the method of linear measurement that was used? (2 marks)
 - What are the limitations of this method? (5 marks)
 - In order to compute the coverage area of the site, the officer had to establish their pace factor. Show how the officer could have established their pace factor. You are expected to present a table, and a calculation of how the pace factor was established. (5 marks)
 - Using the established pace factor from iii) above, compute the coverage area of the gravesite. (8 marks)
- d) With the aid of illustrations, discuss the three classes of map projection systems. (10 marks)

(40 Marks)

SECTION B: ANSWER ANY TWO QUESTIONS

Question 2

- a) Outline the three stages involved in the surveying process. (10 marks)
- b) Discuss the sources of errors in chaining and how these can be minimized. (10 marks)
- c) A plot of land was surveyed using a tape measure 49.952 m long, and the area computed was 23475 m².
- (i) Calculate the percentage error of this tape measure. (4 marks)
- (ii) What was the true area of the plot in both hectares and square kilometres? (6 marks)

(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) Name any three methods of computing areas from maps other than the Simpson's and Trapezoidal's Rules. (3 marks)
- b) Briefly discuss the role of symbols in modern cartography. (6 marks)
- c) The chain surveying data on Table 2 were recorded in the field when chaining and measuring off-sets of a proposed road or track from a nearby embankment.
- i) Define offset as used in chain surveying. (2 marks)
- ii) What are the three methods of measuring offsets? (3 marks)
- iii) Draw the index diagram, and compute the area between the road and the embankment using both the Simpson's and the Trapezoidal rules. (16 marks)

Table 2. Embankment chaining field measurements.

Station	A	B	C	D	E	F	G	H	I	J	K
Chainage (m)	0	10	20	30	40	50	60	70	80	90	100
Offset (m)	6.3	4.2	3.8	2.1	8.2	9.3	6.7	4.6	3.2	1.2	0.2

(30 Marks)

Question 5

- a) A gully was developing at the rate of 50mm per month on average. A surveyor used an abney level to measure the depth of the gully. During measurement, the abney level recorded an angle of elevation of 30° from the horizontal plane of the sight. The survey station was 25 metres away from the gully and the surveyor's eyesight height was 1.7 metres.
- i) Determine the depth of the gully. (10 marks)
 - ii) How long did it take the gully to reach this depth? (5 marks)

- b) Explain any five controls or external forces that influence map designing. (15 marks)

(30 Marks)