UNIVERSITY OF SWAZILAND

DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND PLANNING

SUPPLEMENTARY EXAMINATION: JULY 2007
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 QUESTION 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

(b) Define map projection. (5 Marks)

(a) Briefly explain the following map projections:

(i) Conformal projection;
(ii) Equal-area (or equivalent) projection;
(iii) Equi-distant projection; and
(iv) Azimuthal projection.

(20 Marks)

(b) State the basic graphic elements which can be used to create all visual designs, and indicate what they convey.

(15 Marks)
(40 marks)

SECTION B

ANSWER ANY ONE QUESTION FROM THIS SECTION

QUESTION 2

(a) The basic graphic elements can be made to appear more or less distinctive and prominent by employing primary visual variables. Explain **FOUR** primary visual variables.

(20 Marks)

(b) Briefly explain the following classes of symbols:

(i) Point-emphasising symbols; and
(ii) Line-emphasising symbols; (10 marks)
(30 marks)

QUESTION 3

(a) Indicate the purposes of the following categories of maps:

(i) Topographic maps;
(ii) Charts;
(iii) Cadestral maps; and
(iv) Plans.

(20 Marks)

(b) Explain the role of map scale. (5 marks)

(c) The plan of a field of an area of 17.436 hectares covers 27,900 mm² of paper. What is the scale?

(5 Marks)
(30 marks)

SECTION C

ANSWER ANY ONE QUESTION FROM THIS SECTION

QUESTION 4

(a) With relevant examples, compare and contrast mistakes and errors.

(10 Marks)

(b) During the measurement in catenary of a survey line of four bays the following information was obtained:

Measured			Difference in level between ends (m)	Tension (N)
Bay	Length (m)	Temperature (°C)		
1	29.899	18.0	+0.064	178
2	29.901	18.0	+0.374	178
3	29.882	18.1	-0.232	178
4	29.950	17.9	+0.238	178

QUESTION 4 (b) Continued

The tape has a mass of 0.026kg/m and a cross-sectional area of 3.24mm^2. It was standardised on the flat at 20°C under a pull of 89N. The coefficient of linear expansion of the material of the tape is 0.000011/°C, and Young's modulus is 20.7x10^{4}MN/m^2. The mean level of the line is 26.89m above mean sea level. Determine the absolute length of the survey line.

(20 Marks)
(30 marks)

QUESTION 5

(a) Briefly explain the Traverse method of surveying. (15 Marks)

(b) When plotting closed-loop compass and tape traverses closure errors do arise. Outline two methods that can be used to correct the mis-closure.

(15 Marks)
(30 marks)

APPENDIX

$$correction\ for\ pull = (P - P_s)\frac{L}{(AE)}$$

where P, Ps = field and standard tensions respectively;
A = cross-sectional area of band;
E = Young's modulus of elasticity for the band;
L = Length measured.

Correction for temperature = $\alpha L(t - ts)$

Where α = coefficient of linear expansion.
t = field temperature
ts = standardisation temperature

$$correction\ for\ slope = -\frac{h^2}{2L}$$

Where h = difference in level between points

$$correction\ for\ sag = -\frac{w^2 L^3}{24P^2}$$

Where w = weight per unit length of the tape