THE KENYA POLYTECHNIC UNIVERSITY

COLLEGE

DEPARTMENT OF SURVEYING & MAPPING

DIPLOMA IN LAND SURVEY

END OF YEAR I EXAMINATIONS

NOVEMBER 2007

TOPOGRAPHICAL SURVEYING

3 HOURS

INSTRUCTIONS TO CANDIDATES:

You should have the following for this examination:

Answer booklet

Scientific calculator

Answer any FIVE of the following EIGHT questions.

Use neat sketches where applicable.

All questions carry equal marks and the maximum marks for each part of a question are as shown.

This paper consists of **3** printed pages.

1. (a) Outline FIVE sources of error and their prevention in chain surveying.

   (b) A field was surveyed by a chain and the area was found to be 127.34 hectares. If the chain used in the measurement was assumed to be 100.0m long but it was actually 100.8m long, calculate the correct area of the field.

   (20 marks)

2. (a) A closed compass traverse was run over stations ABCDEA and the observations are as shown in table 1. Compute:

   (i)   The corrections for each line

   (ii) The corrected forward and back bearings

   (b) Outline FIVE advantages and FIVE disadvantages of plane tabling.

   Table 1:   (20 marks)

LINE	Forward bearing	Back bearing
AB	$292^0\ 15'$	$111^0\ 45'$
BC	221 45	41 45
CD	90 05	270 00
DE	80 35	261 40
EA	37 00	216 30

3. (a) With the aid of sketches, outline the procedure of determining and distributing the closing error (misclosure) of a compass traverse through graphical adjustment.

   (b) Outline the procedure of setting up the plane table.   (20 marks)

4. (a) With the aid of sketches explain how traversing is achieved in plane tabling.

   (b) Outline THREE classifications of errors in compass surveying, giving specific examples of each of their sources.   (20 marks)

5. (a) In a chain survey exercise, there is an obstacle in the form of a pond on the main chain line AB. Two points C and D were marked on opposite sides of the pond along the chain line. A line CE of length 100m was established to the left of CD, while to the right a second line CF of length 80m was laid out such that E, D and F are in the same straight line. When ED and DF

were measured, they were found to be 60m and 56m respectively. Calculate the obstrated length CD.

(b) List and define any FIVE terminologies used in conjunction with compass surveying. (20 marks)

6. (a) Outline any FIVE characteristics of contour lines.

(b) Explain FOUR uses of plane table in toposurvey. (20 marks)

7. (a) With the aid of a sketch, derive formulae for horizontal distance during horizontal sight and staff vertical configuration in tacheometry.

(b) Explain FIVE ways of contouring using the indirect method. (20 marks)

8. (a) A theodolite was set up over point P and observations made to a staff at point Q. The observations were:

Vertical angle $94^0 20'36''$, upper stadia reading 2.518, mid-reading 2.118 and bottom reading 1.718. If the height of instrument was 1.550m additive factor 0.30m and the stadia intercept factor 100.0, calculate the:

(i) The horizontal distance PQ

(ii) The height of Q if that of P=100.0m

(b) Outline the classifications of errors in plane tabling giving specific examples of each of their sources. (20 marks)