



THE KENYA POLYTECHNIC UNIVERSITY COLLEGE

DEPARTMENT OF SURVEYING & MAPPING

DIPLOMA IN LAND SURVEY

END OF YEAR I EXAMINATIONS

NOVEMBER 2007

SURVEYING INSTRUMENTS

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 2 printed pages.

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1. Describe FOUR methods of setting out offsets using a chain and a tape only.
(20 marks)
2. (a) Explain field procedure for determining the bubble tube sensitivity.
(10 marks)
(b) Outline the procedure for correcting collimation error in a tilting level.
(10 marks)
3. (a) Draw a labeled diagram showing the optical train of an optical theodolite reading system.
(6 marks)
(b) Explain the temporary adjustments of an optical reading theodolite.
(14 marks)
4. (a) State TWO differences between a tilting level and a dumpy level.
(3 marks)
(b) State the unique feature in an automatic level.
(2 marks)
(c) Explain the procedure for setting up a dumpy level before it is ready for use.
(15 marks)
5. (a) Lists THREE types of compasses.
(3 marks)
(b) Explain the operation of a box sextant.
(17 marks)
6. (a) Draw a labeled diagram of a theodolite.
(10 marks)
(b) Outline the geometrical principles that must be fulfilled for a theodolite to be in adjustment.
(10 marks)
7. Explain the “Two peg” test and show how the elements for correction of readings are derived from first principles.
(20 marks)
8. (a) Explain the principle of an optical square.
(5 marks)
(b) Explain how an offset can be set out using an optical square. (15 marks)