



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)

University Examinations 2015/2016

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

FIRST SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE IN CIVIL
ENGINEERING

ECV 206: SURVEYING II

Date: 19/04/2016

Time: 8.30-10.30 AM

INSTRUCTIONS

This paper consists of FIVE questions

Answer question one and other two questions in this paper

QUESTION ONE(30 marks)

- a) Describe the procedure of setting up a theodolite. (8 marks)
- b) Describe with examples the three major types of errors in theodolite measurement (12 marks)
- c) Briefly explain what you understand by the term trigonometric levelling. (3 marks)
- d) Give FOUR uses of the stadia method in tacheometry. (4 marks)
- e) Explain what you understand by the term plane table surveying (3 marks)

QUESTION TWO (20 marks)

- a) An instrument was set up at P and the angle of depression to a vane 2 m above the foot of the staff held at Q was $5^{\circ} 36'$. The horizontal distance between P and Q was known to be 3000 metres. Determine the R.L. of the staff station Q given that staff reading on a B.M. of elevation 436.050 was 2.865 metres. (14 marks)
- b) Outline the procedure of carrying out a plane table surveying. (6 marks)

QUESTION THREE

- a) Explain briefly how the following distinct operations at each survey station are carried out for the temporary adjustments of a vernier theodolite.
- a) Centring
 - b) Leveling
 - c) setting
 - d) focusing
- (8 marks)
- b) Data from a differential leveling have been found in the order of B.S., F.S..... etc. starting with the initial reading on B.M. (elevation 150.485 m) are as follows : 1.205, 1.860, 0.125, 1.915, 0.395, 2.615, 0.880, 1.760, 1.960, 0.920, 2.595, 0.915, 2.255, 0.515, 2.305, 1.170. The final reading closes on B.M... Put the data in a complete field note form and carry out reduction of level by Rise and Fall method. All units are in meters. (12 marks)

QUESTION FOUR

- a) State and explain the **Four** methods of plane table survey. (12 marks)
- b) A closed traverse as shown below (Fig. Q₄b.)Is conducted with five stations A, B, C, D and E taken in anticlockwise order, in the form of a regular pentagon. If the FB of AB is $30^0 0'$, find the FBs of the other sides.

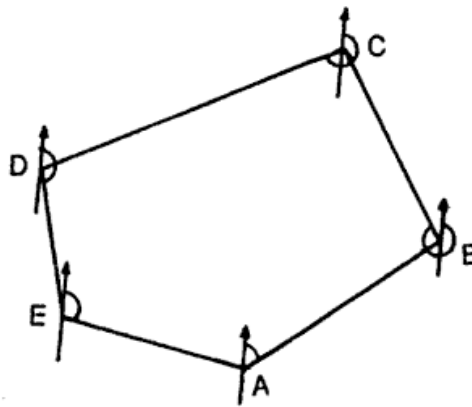


Fig. Q₄b. closed traverse

(12 marks)

QUESTION FIVE

- a) Define the term tacheometry and explain the basic principles of optical measurement using this method (8 marks)

- b) Explain the method of include angles of theodolite traversing (4 marks)
- c) State FOUR uses of the Total Station (4 marks)
- d) Tacheometry method is used to indirectly measure distances and differences in elevation.
List Two advantages of this method over the direct methods of measurement of these two quantities (4 marks)