



TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

DIPLOMA IN BUILDING & CIVIL ENGINEERING

EBC 2106: ENGINEERING SURVEYING II

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: JULY 2013

TIME: 2 HOURS

Instructions to Candidates:

This paper consists of **FIVE** questions

- *Answer Booklet*

Answer question **ONE (COMPULSORY)** in **SECTION A** and any other **TWO** questions in **SECTION B**

Marks are indicated for each part of the question

This paper consists of **THREE** printed pages

SECTION A (Answer all questions in this section - 30 marks)

Question One

- a) With an aid of a diagram, differentiate between FACE LEFT and FACE RIGHT as used in traversing (5 marks)
- b) Convert the following whole circle bearings into quadrant bearing:
(i) $58^{\circ}30'$
(ii) $256^{\circ}22'$
(iii) 322°
(iv) $123^{\circ}45'$ (4 marks)
- c) Differentiate between closed and open traverse (6 marks)
- d) Discuss the procedure of temporary adjustment of a theodolite (15 marks)

SECTION A (Answer all questions in this section - 20 Marks each)

Question Two

- a) What factors are considered in the selection of traverse stations (10 marks)
- b) Define tacheometry and state its application in linear measurements (3 marks)
- c) Using a sketch, derive the equations for both horizontal distance (H) and difference in levels (L) between two points when both β and α are angles of elevation (7 marks)

Question Three

- a) A theodolite whose height of the instrument level is 1.86m has a multiplying constant of 100 and additive constant of 1.0. If the angle of elevation is 8° and the upper, middle and lower stadia readings are 4.95m, 3.5m and 2.1m respectively, what is the distance of the staff from the station and what would be the reduced level at the staff? (5 marks)
- b) A traverse was run between points A to E as shown below, calculate the partial coordinates (15 marks)

Question Four

- a) Explain random and Gross errors of a theodolite (10 marks)
- b) Make short notes on the following:
- (i) Magnetic bearing
 - (ii) Diurnal variations
 - (iii) Assumed bearing
 - (iv) Magnetic north
 - (v) Magnetic declination (10 marks)

Question Five

- a) What are the functions of the following parts of theodolite?
- (i) Foot screws
 - (ii) Optical plummet
 - (iii) Trivet stage
 - (iv) Altitude Spirit bubble (8 marks)
- b) Discuss the procedure of obtaining observation by using reiteration method (12 marks)

