



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)
Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING
CONSTRUCTION TECHNICIAN CERTIFICATE PART I

EBC 1105: CHAIN SURVEYING I
SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: MAY/JUNE 2012

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*
- *Scientific calculator*

This paper consists of **FIVE** questions

Answer any **THREE** questions.

Maximum marks for each part of a question are clearly shown

This paper consists of **THREE** printed pages

Question 1 (20 marks)

- a) Define the following categories of surveying
i) Engineering
ii) Topographical
iii) Hydrographic (3 marks)
- b) With the aid of sketches, describe the following chain surveying instruments (12 marks)
i) The steel band
ii) Ranging rod
iii) Site square
- c) Show that the correction for slope is given by:
$$\text{Correction} = L(1 - \cos \theta)$$
Where L = length of line measured
$$\theta$$

= angle of slope (5 marks)

Question 2 (20 marks)

- a) Define the **TWO** main branches of surveying (3 marks)
- b) Define the following terms as used in chain surveying (4 marks)
i) Check line
ii) Chainage
iii) Oblique Offset
iv) Trilateration
- c) State the aims of reconnaissance in chain surveying (4 marks)
- d) With the aid of sketches, explain the following chain surveying procedures (8 marks)
i) Setting out a right angle from a survey line by 3:4:4 methods
ii) Measuring a right angle with an optical square

Question 3 (20 marks)

- a) List the **THREE** categories of obstacles in chain surveying (1½ marks)
- b) With the aid of a sketch, describe the following chain surveying procedures
i) Measuring a line across a wide river without setting out right angles (7½ marks)
ii) Measuring a line across a pond without setting out right angles (4 marks)
iii) Ranging a line over a small hill by the repeated alignment technique (7 marks)

Question 4 (20 marks)

- a) State any **FIVE** points to be considered in the selection of stations in chain surveying (5 marks)
- b) Differentiate between cumulative and random errors stating how each can be eliminated in chain surveying and giving two examples of each (7½ marks)
- c) A line AB was measured with a tape believed to be 20.00m and found to be 636.04m long. However, on re-examination the tape was found to measure 19.925m long. Given the following:
- The day temperature was = 32.5°C
 - The standard temperature = 20°C
 - Ground slope = 12°
 - The coefficient of linear expansion of the tape as 0.000011m per °C. Calculate:
- i) Correction for temperature
 - ii) Correction for slope
 - iii) Corrected length of the line for standardization (wrong length)
 - iv) The correct length of the line (8½ marks)

Question 5 (20 marks)

With aid of sketches, explain the following chain surveying procedures.

- a) Measuring a line across a wide river by setting out right angles (6 marks)
- b) Measuring an angle of slope with an abney level (7 marks)
- c) Measuring a line across a tall building by setting out (7 marks)