



TECHNICAL UNIVERSITY OF MOMBASA
**Faculty of Engineering &
Technology**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING
DIPLOMA IN BUILDING & CIVIL ENGINEERING
DIPLOMA IN ARCHITECTURE

EBC 2101: ENGINEERING SURVEYING I

END OF SEMESTER EXAMINATION

SERIES: APRIL 2013

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- Answer Booklet

This paper consists of **FIVE** questions. Answer question **ONE** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One (Compulsory)

- a) Differentiate between the following pair of terms as used in chain surveying:
(i) Survey line and check line
(ii) Oblique offset and perpendicular offset
(iii) Chainage and chain surveying **(6 marks)**
- b) State the precautions for eliminating the following types of errors in chain surveying giving an example of each error
- c) Show that the correction for slope is given by:
$$\text{Correction} = l (1 - \cos \theta)$$

L = length of measured line
 θ
= angle of slope **(4 marks)**
- d) (i) A line was measured with a tape measure believed to be 30.00m but on re-examination it was found to measure 30.025m. Given the length of the measured line as 622.758m calculate the correct length of the line.

(ii) If the tape in 1d (i) above was used to measure area 2.058 hectares, calculate the correct area. **(4 marks)**

Question Two

The following data was recorded in a series leveling exercise:
2.780, 2.975, 2.675, 2.599, 2.475, 2.611m 2.887, 3.110, 3.075, 3.817
1.117, 1.285, 1.489, 1.107, 0.977, 1.385, 1.512, 1.685, 1.208, 2.850 all in metres. The first point was taken on a temporary bench mark of reduced level 200.00m and the underlined figures are foresight. Reduce the levels by the rise and fall method applying the usual arithmetical checks. **(20 marks)**

Question Three

- a) (i) State the objective of a reconnaissance survey. **(2 marks)**

(ii) State any **FIVE** points to be considered in the selection of stations in chain surveying. **(5 marks)**
- b) With the aid of sketches, describe the following chain surveying procedures.
(i) Setting out a right angle from a point to a line **(4 marks)**
(ii) Measuring a line across a wide road without setting out right angles. **(5 marks)**
(iii) Measuring a line across a pong by setting out right angles. **(4 marks)**

Question Four

- a) Describe the following temporary adjustments of a titling level:
(i) Setting up the tripod stand

- (ii) Centering the circular bubble
- (iii) Centering the spirit bubble
- (iv) Focusing and elimination of parallex (10 marks)

b) Table 1 shows staff readings for a leveling exercise:

- (i) Reduce the levels by the height of collimation method.
- (ii) Calculate the gradient of line AB (10 marks)

TABLE 1

BS	IS	FS	Remarks
2.57			BM L = 38.594m
	2.447		Point A ch = 0.0
	2.378		ch 20
	2.411		ch 40
2.557		2.5780	ch 60
	2.890		ch 80
	2.911		ch 100
2.978		2.9000	ch 120
	2.807		ch 140
	2.878		ch 160
		2.7780	Point B Ch = 160.0

Question Five

- a) With the aid of a sketch, describe the direct method of contouring (9 marks)
- b) (i) State the essential difference between a tilting level and a dumpy level
- (ii) With the aid of a sketch describe a tilting level with tot screws. (11 marks)