



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY

Department of architecture and built environment

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN ARCHITECTURE

EBC 2102 : ENGINEERING SURVEYING I

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: JULY 2025

TIME: 2 HOURS

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, Calculator, examination pass and student ID

This paper consists of five questions.

Attempt any THREE questions.

Do not write on the question paper.

QUESTION ONE (20 Marks)

- a) With the aid of a sketch the process of chain surveying. (9 Marks)
- b) With the aid of sketches, describe the process of Chaining between stations and picking of points of details. (7 Marks)
- c) State the factors to consider in the preliminary stage of chain Surveying. (4 Marks)

QUESTION TWO (20 Marks)

- a) With the aid of sketch the process of chaining across an intervening hill using a reciprocal ranging method. (8 Marks)
- b) Briefly explain THREE main sources of errors in chain surveying (6 Marks)
- c) With the aid of sketches describe method of setting out a right angle to locate a point of detail using a tape only. (6 Marks)

QUESTION THREE (20 Marks)

- a) State the difference of the following terms as used in levelling practice
 - i) Bench mark and temporary bench mark
 - ii) Level line and horizontal line
 - iii) Vertical interval and horizontal equivalent
 - iv) Back sight and foresight (8 Marks)
- b) Briefly describe the procedure of setting up of the dumpy level to make it ready for use in levelling. (6 Marks)
- c) State the factors that contribute to errors in the levelling practice. (4marks)

QUESTION FOUR (20 Marks)

- a) State FOUR characteristics of contours. (4 Marks)
- b) Briefly describe the Grid method of contouring. (6 Marks)
- c) A leveling instrument was used to determine levels at points along the line of the foundation. The staff readings are as shown in the table 4a below

Table 4a

B.S.	I.S.	F.S.	R.L.
1.501			32.00m
	1.604		
	1.405		
	2.106		

	1.580		
2.455		2.310	
	1.867		
		2.110	

- i) Reduce the levels by the rise and fall method. (8 Marks)
- ii) Carry out all the necessary arithmetic checks (2 Marks)

QUESTION FIVE (20 Marks)

- a) State the difference between the Dumpy level and the tilting level. (6 Marks)
- b) With the aid of a sketch describe the features of an Optical automatic levelling instrument. (8 Marks)
- c) State the effects of the following factors in levelling practice
 - i) Refraction
 - ii) High temperatures
 - iii) Wet weather
 - iv) Rugged terrain (6 Marks)