



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING & TECHNOLOGY
DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN CIVIL ENGINEERING

DCE 2109 : ENGINEERING SURVEYING 1

END OF SEMESTER EXAMINATION

SERIES: APRIL 2025

TIME: 2 HOURS

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID, Scientific Calculator

This paper consists of five questions.

Attempt any THREE questions.

Do not write on the question paper.

QUESTION ONE (20 Marks)

(a) Describe the temporary adjustment of dumpy level (10 Marks)

(b) With the aid of sketches briefly describe the Two Peg test of determining whether the leveling instrument is in adjustment (10

Marks)

QUESTION TWO (20 Marks)

- (a) With the aid of a sketch, briefly explain a procedure of chaining a cross a river/ busy road by setting out right angles (6 Marks)
- (b) Briefly explain THREE main types of errors in chain surveying (6 Marks)
- (c) A chain of nominal length 20m measures 20.08 m when compared with standard length. If this chain is used to measure a length AB and the measurement recorded is 131.65 m
- (i) determine the true length of line AB (3 Marks)
 - (ii) If an area of 4.225 acres was measured using the tape determine the true area (5 Marks)

QUESTION THREE (20 Marks)

- (a) Define the following as applied in leveling:-
- (i) Bench mark
 - (ii) Line of collimation
 - (iii) Spot height
 - (iv) Back sight
 - (v) Fore sight (10 Marks)
- (b) Briefly describe the procedure of temporary adjustments to a tilting level. (10 Marks)

QUESTION FOUR (20 Marks)

- (a) When checking a dumpy level, the following readings were obtained in the “ two peg test “
- Level set up midway between two staff stations A and B, 100m apart, staff reading on A is 2.103m and on B is 1.664m
 - Level set up 10m behind B and in line AB, staff reading on B is 1.389 and on A is 1.859m
- (i) Calculate the true reading on staff at A and B (4 Marks)
 - (ii) Explain how you will adjust the line of collimation (6 Marks)
- (b) (i) Explain the essential difference between the Automatic level and other types of levels. (5 Marks)
- (ii) Explain the parallax adjustment procedure for a level (5 Marks)

QUESTION FIVE (20 Marks)

(a) (i) Explain FIVE characteristics of contours (5 Marks)

(ii) Briefly describe direct method of contouring (5 Marks)

(b) A leveling instrument was used to determine ground levels at points along the line of the trench, and staff readings are as shown in the table.

B.S.	I.S.	F.S.	R.L.
1.50			30.00
	1.60		
	1.60		
	2.10		
	1.80		
		2.30	

(i) Complete the rise and fall column columns and reduce the levels (8 Marks)

(ii) Carry out the usual arithmetic checks (2 Marks)