



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

University Examination 2010

SECOND YEAR/FIRST SEMESTER EXAMINATION FOR THE DEGREE IN BACHELOR OF SCIENCE IN CIVIL ENGINEERING SUPPLEMENTARY PAPER

ECE 2202: SURVEYING I

SERIES: APRIL/MAY 2010

TIME: 2 HOURS

Instructions:

You should have the following for this examination:

- Answer booklet
- Mathematical table/pocket calculator

Question **ONE** is Compulsory. Answer any other **TWO** questions from the remaining FOUR questions.

QUESTION ONE

(a) Write concisely on the following:

- | | | |
|-------|-------------------|-----------|
| (i) | Accidental errors | (5 marks) |
| (ii) | Safeguarding | (5 marks) |
| (iii) | Control | (5 marks) |
| (iv) | Systematic errors | (5 marks) |

(b) Define the following terms:

- | | | |
|--------|-----------------------|----------|
| (i) | Foresight | (1 mark) |
| (ii) | Level surface | (1 mark) |
| (iii) | Height of collimation | (1 mark) |
| (iv) | Reduced level | (1 mark) |
| (v) | Bench mark | (1 mark) |
| (vi) | Contour line | (1 mark) |
| (vii) | Contour interval | (1 mark) |
| (viii) | Level line | (1 mark) |
| (ix) | Datum surface | (1 mark) |
| (x) | Back sight | (1 mark) |

QUESTION TWO

- (a) Outline the process of leveling. (8 marks)
- (b) Using the Height of collimation method reduce the leveling field notes below and apply the necessary checks. (12 marks)

STN	B.S.	I.S.	F.S.	R.L.	REMARKS
1	1.350			100.000	BM
2		1.150			
3		1.855			
4		0.250			
5	1.750		1.500		CP
6		2.185			
7		2.205			
8	0.950		1.350		CP
9			2.350	98.850	BM

QUESTION THREE

- (a) Describe how you would continue a chain line under the following conditions:
- (i) a building lying on the chain line
 - (ii) chain line crosses a pond (10 marks)
- (b) Describe, stating the use, the various lines used in chain surveying. (10 marks)

QUESTION FOUR

- (a) Briefly explain the following, stating the purpose of each:
- (i) Profile leveling
 - (ii) Cross-sectioning
 - (iii) Reciprocal leveling
 - (iv) Precise leveling (10 marks)
- (b) Following are results from reciprocal leveling between points A and B across a wide river. The horizontal distance was measured as 53.46m.

INSTRUMENT POSITION	STAFF POSITION	STAFF READING (m)
I ₁	A	3.101
I ₁	B	2.247
I ₂	A	2.382
I ₂	B	1.564

- (i) Determine the reduced level of B if that of A is 1705.790m above MSL.
- (ii) Calculate the collimation error in the level per 60m sight. (10 marks)

QUESTION FIVE

Using the profile leveling notes given below obtain the heights of the staff stations using the rise and fall method applying the usual checks, and plot the profile at a suitable scale.

STATION	CHAINAGE	B.S	I.S	F.S.	R.L.	REMARKS
BM	-	6.72			34.00	BM ON MANHOLE
1	0+000		4.20			
2	0+015		7.87			
3	0+030		5.01			
4	0+045		4.03	3.42		
5	0+060	6.57				
6	0+075		5.36			
7	0+090		4.25			
8	0+105		4.03			
9	0+120	5.42		3.80		
10	0+135		5.84			
11	0+150		6.36			
12	0+165			6.86		

(20 marks)