



# THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

(A Centre of Excellence)

## Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

**UNIVERSITY EXAMINATION FOR:**  
BACHELOR OF ENGINEERING IN BUILDING & CIVIL ENGINEERING  
(BECB 11)

ECE 2202: ENGINEERING SURVEYING I

**END OF SEMESTER EXAMINATION**

**SERIES: DECEMBER 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 question **ONE (COMPULSORY)** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

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### Question One (Compulsory)

- a) Define the term chain survey and hence establish:
- (i) **FOUR** equipment that are used for linear measurement
  - (ii) **FOUR** equipment that are used for marking out
  - (iii) **FOUR** equipment used for setting simple angles. (15 marks)
- b) Outline any **TWO** types of obstacles encountered in chain surveying giving remedial measurement to overcome them in each case. (5 marks)

- c) In chain survey errors may result from many causes. State and explain errors encountered when carrying out a chain surveying. **(10 marks)**

### Question Two

- a) (i) Differentiate between the following:
- (i) Topographic Survey and Cadastral Survey
  - (ii) Aerial Survey and Geodetic Survey
- (ii) Identify the following conventional symbols of features met in chain survey.

(iii) The correct area if the area measured by the same tape was found to be 5 hectares. **(10 marks)**

- b) Explain the following terms as used in linear measurement:
- (i) Offsets
  - (ii) Reconnaissance survey
  - (iii) A field book
  - (iv) Good measuring conditions
  - (v) Survey team
- (10 marks)**

### Question Three

- a) Define the following terms as used in leveling:
- (i) Precise levels
  - (ii) Autoset levels
  - (iii) Fore sight
  - (iv) Back sight
  - (v) Intermediate sight
- (5 marks)**
- b) With a well elaborated illustration, describe a Stanley dumpy level used in leveling. **(10 marks)**

- c) Carefully elaborate the steps followed when setting up a dumpy level and a tripod stand. **(5 marks)**

#### Question Four

- a) The following staff readings are taken from a level book. Reduce the levels by the rise and fall method and carry out the routine arithmetical checks on the completed entries.

B.S	I.S	F.S	Remarks
1.32			Peg A
	2.43		Peg B
	1.15		Peg C
	1.72		Peg D
5.06		1.22	Peg E
	4.97		Peg F
	4.47		Peg G
	3.25		Peg H
		1.82	Datum of R.L 30.00

**(15 marks)**

- b) Briefly explain how to overcome the following obstacles in leveling:
- (i) A building
  - (ii) High walls
  - (iii) Shallow ponds and streams

**(5 marks)**

#### Question Five

- a) The second year Engineering students of Mombasa Polytechnic University are required to set out level pegs on the new building site close to the main entrance gate for the following:

Ground floor finished floor level	100.68
Paving at highest point	100.92
Paving at lowest point	100.14
Garage floor level	101.23
Highest Manhole cover	101.36

A temporary bench mark 100.00 has been designated on the site and a back sight reading of 2.74 taken.

- (i) What staff reading are required to set the pegs at these levels?
- (ii) If the ground slopes downwards at an inclination of 1:60 away from the highest manhole, what will be the level and staff reading on a manhole cover 10.800m distance?
- (iii) If the drain invert is to be 1.740m below both manhole covers, what reading will be required on the staff for the sight rails to be set at 3.610m above invert level? **(10 marks)**

- b) Define the term 'Contouring' hence briefly elaborate on the following methods of determining contours.

- (i) Grid method
- (ii) Radial line
- (iii) Direct method

**(10 marks)**