THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

(A Centre of Excellence)

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

DIPLOMA IN CIVIL ENGINEERING
DIPLOMA IN BUILDING & CIVIL ENGINEERING
DIPLOMA IN ARCHITECTURE

EBC 2129: ENGINEERING SURVEYING I

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: OCTOBER 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 any **THREE** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One (20 Marks)

a) Define the following terms as used in leveling.
- **i)** Level line
- **ii)** Horizontal line
- **iii)** Line of collimation
- **iv)** Bench mark **(4 marks)**

b) The data shown in table 1 is for a leveling exercise along the length of a proposed road. The reduced level of the first point is 62.000m. Using the rise and fall method, calculate the reduced level of the points applying the usual arithmetical checks. **(16 marks)**

Table 1

BS	IS	F	Chainage (m)	Remarks
1.570				BM RL = 62.00m
	2.500		0.00	Point A
	3.500		20.00	B
	1.010		40.00	C
1.715		2.570	60.00	D
	2.553		80.00	E
	1.567		100.00	F
	1.890		120.00	G
1.567		2.050	140.00	H
	- 1.500		160.00	J
	- 0.900		180.00	K
	- 1.234		200.00	L
		1.500	220.00	M

Question Two (20 Marks)

a) (i) State any **TWO** factors that dictate the choice of vertical interval in contouring. **(2 marks)**

(ii) State any **THREE** characteristics of contouring **(3 marks)**

b) With the aid of a sketch and suitable example, describe reciprocal leveling stating the type of error eliminated by the technique. **(7 marks)**

c) With the aid of a sketch, describe the radial lines method of contouring. **(8 marks)**

Question Three (20 Marks)

The following readings were taken in series during a leveling exercise, with the underlined readings being back right.

1.750, 1.225, 1.578, 3.225, 1.500, 2.578,

1.678, 3.822, 4.010, 2.551, 1.788
1.050, 3.221, 2.875, 3.811, 2.050

The reduced level of the first point is given as 100.00m. Reduce the levels of the other points applying the appropriate arithmetical checks. Use the height of collimation method. **(20 marks)**

Question Four (20 Marks)

a) Differentiate between cumulative and random errors, stating how they are eliminated in chain surveying. **(5 marks)**

b) The information show below refers to the measurement of a line with a steel band believed to measure 50.00m but on re-examination it was found to be 49.971m only.

- Day temperature – 30°C
- Co-efficient of linear expansion of steel band - 0.000022 per °C
- Angle of slope – 11°
- Measured length - 610.00m long
- Standard temperature of tape = 20°C

Calculate the following:

i) Corrected length for standardization
ii) Correction for temperature
iii) Correction for slope
iv) Final collected length of the line **(8 marks)**

c) With the aid of a sketch, describe the random line method of measuring a line over a small hill. **(7 marks)**

Question Five (20 Marks)

a) Define the following terms as used in chain surveying.
i) Chainage
ii) Oblique offset
iii) Proof line
iv) Well-conditioned triangle **(4 marks)**

b) With the aid of sketch, describe the measurement procedure of a line across a wide road without setting out right angles. **(6 marks)**

c) State any **FIVE** points to be considered in the selection of station for a chain survey. **(5 marks)**

d) Describe the step chaining technique. **(5 marks)**