THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

HIGHER DIPLOMA IN BUILDING & CIVIL ENGINEERING

EBE 3105: SITE SURVEY & SEETING OUT I

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: FEBRUARY/MARCH 2012
TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer booklet*
- *Mathematical Tables*
- *Scientific Calculator*

This paper consists of **FIVE** questions
Answer question **ONE (COMPULSORY)** from **SECTION A** and any other **TWO** questions from **SECTION B**
Maximum marks for each part of a question are clearly shown
This paper consists of **THREE** printed pages

SECTION A (COMPULSORY)

Question 1

a) (i) Differentiate between the following types of errors in chain surveying giving two examples of each:
   (i) Cumulative errors
   (ii) Cross errors

(ii) Show that correction for slope in linear measurement is given by:

$$\ell = \frac{h^2}{2l}$$

Where: ℓ = correction for slope
h = difference in height between measuring heads
L = Measured line (10 marks)

b) Describe the following temporary adjustment of a dumpy level:
   (i) Setting up and leveling
   (ii) Adjustment for parallex (10 marks)

SECTION B (Answer *any TWO questions from this section*)

Question 2

a) Show that the correction for currature in leveling is given by: $C = 0.078K^2$
   Where:
   - C = Correction for curvature in metres
   - K = length given of sight in kilometers (5 marks)

b) The information shown in table 1 is for a leveling exercise along a length of proposed road 200.00m long. Calculate the following:
   (i) The reduced levels of the points by the rise and fall method applying the necessary arithmetical checks.
   (ii) The gradient of the road between points A and K given that the road is to run at uniform gradient between these grounds points. (15 marks)

Table 1

BS	IS	FS	Distance	Remarks
2.548				TBM RL = 100.57
	2.345		0.00	Point A
	2.491			B
	2.590			C
1.278		3.780		D
	1.782			E
	1.994			F

	1.580			G
1.011		2.010		H
	1.257			I
	1.333			J
		0.987		K

Question 3

a) State the precautions necessary to minimize the following errors due to natural cause in leveling.
   - Wind
   - Sun
   - Refraction and curvature (6 marks)

b) (i) State any **THREE** factors that dictate the vertical interval in contouring
   (ii) With the aid of sketch, describe the grid method of contouring (14 marks)

Question 4

a) (i) State any uses of mass haul diagrams
   (ii) State any FOUR properties of mass haul diagrams (10 marks)

b) Explain the procedure used to run a longitudinal section (10 marks)

Question 5

a) (i) Distinguish cross-sections from longitudinal sections
   (ii) With the aid of suitable examples, illustrate the level book form method used for running cross-section (10 marks)

b) The area surrounding Nautical block is to be surveyed. Describe the grid method of contouring that can be applied (10 marks)