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 BUILDING & CIVIL ENGINEERING
DIPLOMA IN ARCHITECTURE

EBC 2129: 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*
- *Pocket Calculator*
- *Pencil & Eraser*

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

a) After completing a survey, the 30m tape used was checked and found to read 29.067m long.
   (i) Determine the correct length of the line AB observed to be 130.49m long
   (ii) The area of the site was calculated from the observed measurement as 2.804ha. Calculate the true area. **(4 marks)**

b) With the aid of a sketch, describe the following chain surveying equipment:
   (i) Open cross staff
   (ii) Ranging rod
   (iii) Drop chain arrow **(11 marks)**

c) Define the following terms as used in chain surveying:
   (i) Base line
   (ii) Survey station
   (iii) Survey line
   (iv) Tie line
   (v) Check line **(5 marks)**

Question Two

a) Define the following terms used in leveling:
   (i) Bench mark
   (ii) Change point
   (iii) Back sight
   (iv) Foresight
   (v) Reduced level
   (vi) Horizontal line **(6 marks)**

b) (i) State any **FOUR** sources of errors in leveling:

$$\frac{d}{2R}$$

   (ii) Show that curvature correction X is given by
       Where d = length of line of sight
           R = Radius of earth. **(8 marks)**

c) Briefly describe the following types of leveling staff
   (i) Telescopic
   (ii) Folding
   (iii) Single length **(6 marks)**

Question Three

a) Define the following terms as applied in contouring:
   (i) Contour line
   (ii) Vertical internal
   (iii) Horizontal equivalent **(3 marks)**

b) With the aid of a sketch, explain the direct method of contouring.

c) Explain the procedure of leveling a dumpy level.   **(11 marks)**

Question Four

The following readings were successively taken with a dumpy level during a leveling exercise:

1.680, 1.720, 2.000, 2.440, 3.120, 2900, 2.140, 2.000, 0.520, 2.260, 2.620, 2.960, 3.340, 0.880.

The first reading was taken on a bench mark whose reduced level was 120.000m. The position of the instrument was changed after taking the 8th and 12th readings.

(i)   Draw up a level field book
(ii)   Enter the reading by the height of collimation method
(iii)   Determine the reduced levels of all the points
(iv) Apply arithmetic check   **(20 marks)**

Question Five

a) Differentiate between the following:
   (i)   Geodetic survey and plane survey
   (ii) Chainage and chaining
   (iii) Trilateration and triangulation   **(6 marks)**

b) Describe a procedure of chaining across a wide river when the survey line crosses the river at right angle by erecting right angles.   **(8 marks)**

c) State **SIX** characteristics of contour lines.   **(6 marks)**