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

EBC 2213: ENGINEERING SURVYEING III

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 **FOUR** printed pages

Question One (20 marks)

a) Differentiate between circular curves and vertical curves. **(2 marks)**
b) Derive expressions for the following elements of a circular curve.
  i) Tangent length
  ii) Long chord
  iii) External distance **(8 marks)**

c) A circular curve 20m radius is to be set out to connect two straight deflecting at an angle of 84°. Calculate the data for setting out the curve by the method of offsets from the tangents give that offsets are required at 3.0m intervals. **(10 marks)**

Question Two (20 marks)

A circular curve 200.0m radius is to be set out to connect two straight deflecting at an angle of 30. The chainage of the intersection point is 509.57m. Given that the curve is to be set out by the method of theodolite and tape, and at a continuous chainage of 20.00m, calculate the setting out data for the curve. **(20 marks)**

Question Three (20 marks)

a) Define the following terms:
  i) Open traverse
  ii) Closed traverse
  iii) Traverse leg
  iv) Closed link traverse **(4 marks)**

b) State any **FOUR** points to be considered in the selection of stations in a theodolite traverse survey. **(4 marks)**
c) The information shown in table 1 retors to a closed link traverse A 12B. Compute the traverse by the transit method. **(12 marks)**

Table 1:

Line	Length (m)	Un-corrected Partial Easting	Un-corrected Partial Northing
A1	507.84	+364.229	+353.019
12	610.84	-433.910	-429.556
2B	391.74	+324.35	+219.724

Datum Co-ordinates

A: 5501.00mE, 4500.00mN

B: 5755.70mE, 4644.08mN

Question Four (20 marks)

a) Table 1 shows the information of the cross-sectional areas along the length of a proposed canal. Calculate the volume of excavation of the portion of the canal by the prismoidal method**. (6 ½ marks)**

Table 2:

Chainage (m)	0	20	40	60	80	100	120	140	160
Cross-section Area (m^2)	14.5	16	18.9	22.4	18.9	14.7	12.00	11.00	9

b) Calculate the following for the cross-section shown in figure 1.

i) Side widths W^1 and W^2

ii) Cross-sectional area **(13 ½ marks)**

Figure 1

Question Five (20 marks)

a)

Figure 2

Table 3:

Line	Length (m)	Un-corrected Partial Eastings	Uncorrected Partial Northings
AB	100.70	+97.269	+26.063
BC	115.25	-77.346	+85.441
CD	118.55	+144.785	29.638
DE	105.50	+76.068	73.102
EF	111.00	+78.071	-78.904

Datum co-ordinates
A: 4000.00mE, 3000.00mN
B: 4288.04mE, 3146.99mN

The data shown in figure 1 and table 3 is for a closed Link traverse ABCDEF. Compute, by the Bowditch's method the total co-ordinates of points B, C, D and E. **(20 marks)**