



MACHAKOS UNIVERSITY

University Examination 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF BUILDING AND CIVIL ENGINEERING
SECOND YEAR SECOND SEMESTER EXAMINATION FOR
DIPLOMA IN BUILDING AND CIVIL ENGINEERING
BCECD 214: ENGINEERING SURVEYING III

DATE: 3/4/2019

TIME: 2:00 – 4:00 PM

INSTRUCTIONS

- i) **Question one is compulsory and carries 30mks**
- ii) **Answer Any other Two questions**

1. a) With the aid of a diagram, show all the elements of a simple circular curve (10 marks)
- b) With the aid of a diagram, describe any three types of horizontal curves. (6 marks)
- c) A tract of land has three straight boundaries AB, BC and CD. The fourth boundary DA is irregular. The measured lengths are under: AB=135m, BC=191m, CD=126m, BD=225m. The offsets measured outside the boundary DA to the irregular boundary at a regular interval of 30m from, are as below

Distance from D(M)0.0	30	60	90	120	150	180
Sets (m) 0.0	3.7	4.9	4.2	2.8	3.6	6.0

Determine the area of the tract (14 marks)

2. The chainage of intersection point of two straights is 1060m and the angle of intersection is 120° . If radius of a circular curve to be set out is 570m, the peg interval is 30m, determine.
- i) The tangent length
 - ii) Length of the curve
 - iii) The chainage at the beginning and the end of the curve
 - iv) The length of the long chord
 - v) The length of the sub-chord
 - vi) Total number of chords (20 marks)

3. A circular curve of 250m radius is to be set out between two straight having deflection angle of $45^{\circ}20'$ right, and the chainage of the point of intersection as 112m. Calculate the necessary data for setting out the curve by the method of offsets from the chord produced taking the length of one chain as 20m (20 marks)

4. The following data was taken while measuring an irregular boundary

Distance from D(m)	0.0	30	60	90	120	150	180
Offsets	00	3.7	4.9	4.2	2.8	3.6	6.0

- a) Calculate the area using :-
 i) Trapezoidal rule
 ii) Simpson's rule
- b) Calculate the volume using :-
 i) End – areas rule
 ii) Prismoidal rule (20 marks)
5. a) With the aid of a diagram, describe five types of horizontal curves (15 marks)
- b) With the aid of a diagram, explain the following
 i) Cut
 ii) Fill
 iii) Cut and fill (5 marks)