



MACHAKOS UNIVERSITY

University Examinations 2017/2018

SCHOOL OF ENGINEERING
DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

SECOND YEAR SECOND SEMESTER EXAMINATION FOR DIPLOMA IN CIVIL
ENGINEERING
BCECD 214 SURVEYING III

DATE:14/12/2017

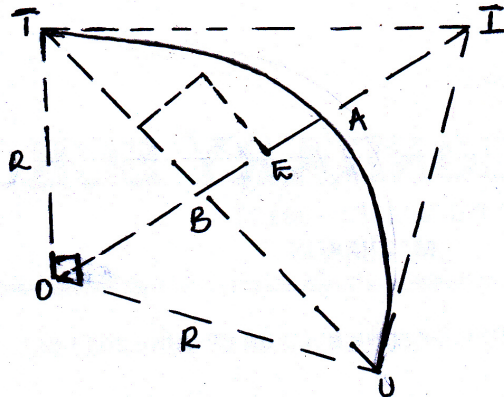
TIME: 8.30-10.30 AM

INSTRUCTIONS

Answer Question One and Any Other Two Questions

1. a) Explain temporary adjustment done to a theodelite (16 marks)
b) Give two functions of the theodelite (2 marks)
c) The following bearing were observed during a compass transverse exercise where local attraction was suspected
- | Line | FB | BB |
|------|----------------------|----------------------|
| AB | 124° 31 ¹ | 304° 30 ¹ |
| BC | 68° 15 ¹ | 246° 00 ¹ |
| CD | 310° 30 ¹ | 135° 15 ¹ |
| DA | 200° 15 ¹ | 17° 45 ¹ |
- i) At which station did local attraction occur
ii) Calculate the corrected bearing and the included angles (12 marks)
2. a) With the aid of a sketch, explain the following types of curves
- Compound curve
 - The reverse curve
 - Transition curve
 - Vertical curve (8 marks)

- b) Two tangents AB and BC intersect at a point B at chainage 150.5m. Calculate all necessary data for setting out a circular curve of radius 100m and deflection angle 30° by the method of offsets from the long chord. (12 marks)
3. a) Derive data for setting out the Kerbline shown below if the radius is 12m and $\angle TOU = 90^\circ$. Offsets are required at 2m intervals. (20 marks)



4. In setting out a circular curve it is noted that the midpoint of the curve is 60m from the intersection point at chainage 7360.45m. If the deflection of the two straights is 48° . Calculate:
- The radius of the curve
 - The chainage at point of tangent at point of curve and point of tangent
 - The 1st, 2nd deflection angles for setting out using 30m chords of a through chainage bases
- (20 marks)
5. A curve of radius 250m is to be set out to connect two railway lines deflecting at $39^\circ 30'$ and $40^\circ 11'$. The chainage at the intersection is 497.50 and the pegs to be placed at 25m interval. Complete and tabulate the setting out data using offsets from chords produced.