TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF BUILDING & CIVIL ENGINEERING
UNIVERSITY EXAMINATION FOR:

DIPLOMA IN BUILDING AND CIVIL ENGINEERING

EBC2105 : SURVEY ENGINEERING 11

END OF SEMESTER EXAMINATION
SERIES: AUGUST 2019
TIME: 2 HOURS
DATE: 10 Aug 2019

Instructions to Candidates
You should have the following for this examination
-Answer Booklet
- examination pass
- student ID
- Scientific Calculator
This paper consists of five questions.
Attempt any THREE questions.
Do not write on the question paper.

QUESTION ONE (20 Marks)

(a) (i) Define tacheometry

(ii) State the TWO basic quantities measured in tacheometry to determine distance **(6marks)**

(b) A theodolite has a multiplying constant of 100 and when set up at A has a height of 1.30m. When sighted onto a vertically held leveling staff at B, the horizontal Centre line gives a reading of 1.40m and the upper and lower stadia lines read 2.00m and 0.80m respectively.

(i) If the angle of elevation of the instrument is 6^0 20', calculate the horizontal distance.

(ii) If the reduced level at B is 104.68m, calculate the reduced level of the ground at A **(8marks)**

(c) Briefly describe temporary adjustment of theodolite **(6 marks)**

QUESTION TWO (20 Marks)

(a) State the sources of errors in theodolite traversing **(10marks)**

(b) The following readings have been taken during a closed compass traverse

Station	Foreword Bearing	Backward bearing
A	192^0 30' (AB)	260^0 30' (AD)
B	276^0 (BC)	10^0 30' (BA)
C	308^0 (CD)	93^0 (CB)
D	75^0 30' (DA)	128^0 (DC)

There is a risk of local attraction affecting the readings. Check the readings and correct if necessary showing the workings **(10marks)**

QUESTION THREE (20 Marks)

(a) Define the term 'curve ranging' **(2 marks)**

(b) Using sketches, describe a method of setting out a curve using two theodolites (**8 marks)**

(c)Two straight roads meet at an angle of $130^0 31'40''$.If the roads are to be connected by a circular curve of 1500m radius, find:-

(i) Total tangent angle

(ii) The tangent distance

(iii) The length of the curve

(iv) Length of long chord (**10 marks)**

QUESTION FOUR (20 Marks)

(a) A simple four sided closed traverse has the following internal angles. A 101^0 30' , B 95^0 30' C 60^0 00' , D 103^0 00' .The lengths of the sides of the traverse are:- AB 65m , BC 110m, CD 98.5m , DE 70m. The whole circle bearing of line AB is $154^0$30' .

(i) Check and adjust the angles if necessary

(ii)Determine the reduced bearings of the sides of the traverse **(12marks)**

(b) Define the following terms used in mass haul diagrams

(i) Balance point

(ii) Free Haul Distance

(iii)Grade point

(iv) Mass Haul Diagram **(8 marks)**

QUESTION FIVE (20 Marks) .

(a) Using Simpson's rule determine the area given by the data below:- **(9 marks**)

Chainage (m)	0	20	40	60	80	100	120
Offsets (m)	0	6.0	9.85	9.0	10.5	13.5	9.75

(b) With the aid of sketches explain how the verticality of a tall building on an open site can be controlled using theodolites (**11 marks)**