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: DECEMBER 2018
TIME: 2 HOURS
DATE: 15 Dec 2018

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) Explain the procedure of tacheometric surveying (**10 marks)**
(b) State **FOUR** applications of tacheometric surveying (**4 marks)**
(b)The upper and lower stadia readings on a transit theodolite are 4.850 and 2.930 respectively. If the instrument has a multiplying constant of 100 and an additive constant of 1.

(i) Determine the distance between the station and instrument

(ii) If the height of the instrument is 182.52m and the axial reading is 3.890, determine the reduced level at the staff station. **.(6 marks)**

QUESTION TWO (20 Marks) .

(a) A clockwise interior angle in a closed traverse is as follows

A= 84^0 58', B=157^0 38', C=24^0 37'D= 153^0 14' , E=103^0 54', F= 139^0 06' G= 236^0 49'

Compute the error of closure and adjust the interior angle (**10 marks)**

(b) With the aid of sketches explain how the verticality of a tall building on an open site can be controlled using theodolites (**10 marks)**

QUESTION THREE (20 Marks) .

(a) Define the terms:

(i) True meridian and bearing

(ii) Magnetic meridian and Bearing: **(4 marks)**

(b) Briefly explain Whole circle bearing and reduced bearing a line **(4 marks)**

(c) (i) Explain the meaning of 'changing face' when using theodolite

(ii) State the purpose of changing face **(4 marks)**

(d) For the given angles convert the whole circle bearing into reduced bearing: 50^0, 176^0, 210^0, 232^0, 150^0, 76^0, 310^0 242^0. **(8 marks)**

QUESTION FOUR (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 $127^0 31'4$.If the roads are to be connected by a circular curve of 600 radius, find:-

(i) The tangent distance

(ii) The length of the curve

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

QUESTION FIVE (20 Marks)

(a) A railway cutting has a formation width of 10m and the side slopes are 1 vertical to 1.5 horizontal The ground surface is everywhere horizontal. The depths of cutting at the center line are given in the table:-

Distance (meters)	0	50	100	150	200	250	300
Depth (meters)	6.60	6.84	7.4	8.6	8.9	9.5	10.4

Determine the volume of the excavation over the length of the cutting using prismoidal

Formula **(14 marks**

)(b) State SIX sources of errors in theodolite traversing **(6marks)**