TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN BUILDING AND CIVIL ENGINEERING

EBC 2102 : ENGINEERING SURVEY II

SPECIAL SUPPLEMENTARY EXAMINATION

SERIES: AUGUST 2017

TIME: 2 HOURS

DATE: 22 Sep 2017

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

-Drawing instruments.

This paper consists of five questions.

Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question One

a) Discuss the following
   i. Open traverse
   ii. Closed traverse **(4 marks)**

b) State the points to be considered when selecting a traverse station. **(4 marks)**

c) Discuss the three stages involved in setting out in civil engineering works **(12 marks)**

Question Two

a) The coordinates of a point A are 311.617mE, 447.245mN. Calculate the coordinates of
   i. Point B where $\theta_{AB} = 37^o 11' 20'' and\ D_{AB} = 57.916M$
   ii. Point C where $\theta_{AC} = 205^o 33' 55'' and\ D_{AC} = 85.071M$ **(8 marks)**

b) In an exercise to determine distances between two points A and B a tacheometer was set up at P and the following observations recorded.

Staff at	Vertical Angle	Staff Reading		
		upper	middle	lower
A	+5°12'	1.388	0.978	0.610
B	-27°35'	1.604	1.286	0.997

Given the height of the instrument was 1.50m, the reduced levels of point P=315.600m and the constants k and c are 100.00and 0.00m respectively. Determine the reduced levels of point A and B. **(12 marks)**

Question Three

a) With the aid of a well labelled sketch, derive a relation that can be used to compute area of an irregularly shaped surface by the trapezoidal method **(7 marks)**

b) The coordinates below were obtained from a survey activity

Station	Eastings(m)	Northings(m)
E	300.00	412.78
F	206.98	567.84
G	468.55	245.12
H	392.93	324.98
I	291.74	198.45

Determine the area enclosed by the coordinates. Give your answer in hectares **(7 marks)**

c) In chain surveying the following offsets were taken to a fence from a chain line. Compute the area bounded by the chain line and the offsets. **(6 marks)**

Chainage (m)	130	150	170	190	210	230	250	270	290	310
Offset (m)	0	6.45	10.46	9.38	11.94	14.86	10.12	5.01	2.79	1.09

Question Four

a) Define the following terms as used in mass haul diagrams
   i. Haul
   ii. Shrinkage
   iii. Borrow
   iv. Waste
   v. Free haul distance
   vi. Limit of economic haul **(6 marks)**

b) Briefly discuss the procedure used in the construction of a mass haul diagrams **(8 marks)**

c) Discuss the uses of mass haul diagrams in civil engineering works **(6 marks)**

Question Five

a) Define the following types of curves
   i. Simple curve
   ii. Transition curve
   iii. Compound circular curve
   iv. Reverse circular curve **(6 marks)**

b) Derive the setting out data for a curved line if the radius of the curve is12m, the angle of intersection is 90^{o} and offsets are required at 2m intervals. **(14 marks)**