



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: 15 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) With the aid of a sketch describe a field procedure of carrying out tacheometry(**8 marks**)

(b) A tacheometry has a multiplying constant of 100 and an addition constant of 2. When a theodolite is set up for use, the trunnion axis has a reduced level of 17.2 m. When sighted onto a vertically held leveling staff, the horizontal centre line reads 1.8 and the lower and upper stadia lines reads 1.4 and 2.2 metres respectively. If the angle of elevation of the instrument is 9° .

Calculate:-

(i) The horizontal distance of the staff from the instrument.

(ii) The reduced level of the ground at the staff position **(12 marks)**

QUESTION TWO (20 Marks)

(a) Define the following as used in traversing:-

(i) Open Traversing

(ii) Closed Traverse

(iii) Whole circle bearing **(6marks)**

(b) Explain TWO reasons for carrying out traversing **(4marks)**

(c)The forward and backward bearings of a closed traverse is as shown. Check the bearings and adjust them, if necessary, for any error due to local attraction. **(10 marks)**

Line	Forward Bearing in degrees	Backward Bearing in degrees
AB	165	-
BA	-	345
BC	63	-
CB	-	241
CD	299	-
DC	-	121
DA	235	-
AD	-	55

QUESTION THREE (20 Marks)

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

(b) Using sketches, describe setting out a curve using tapes by offsets from chords produced (8 marks)

(c) A circular curve of 600m radius is to connect two straights which make an internal angle of 150° with one another. Calculate tangent lengths and the lengths of the long chord and the circular arc (10 marks)

QUESTION FOUR (20 Marks)

(a) A cutting has a formation width of 12m and the side slopes are 1 to 1. The ground surface is horizontal. Find the volume of the excavation between two cross-sections 100m apart.

Vertical depths at the end cross- sections are 3m and 5m respectively. (10 marks)

(b) Briefly describe the sources of error in theodolite traversing (10 marks)

QUESTION FIVE (20 Marks) .

(a) Using Simpson's rule determine the area given by the data below:- (6 marks)

Chainage (m)	0	20	40	60	80	100	120
Offsets (m)	0	6.75	12.85	15.75	14.5	10.50	9..75

(b) (i) Free haul distance

(ii) Limit of economic haul

(iii) Over haul

(iv) Haul

(v) Station meter

(10 marks)

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

(ii) State the purpose of changing face

(4 marks)

