TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

CERTIFICATE IN BUILDING & CIVIL ENGINEERING (CBCE 14M)

EBC 1106: ENGINEERING SURVEYING I

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2014
TIME ALLOWED: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Answer any **THREE** questions of the **FIVE** questions
All questions carry equal marks
Maximum marks for each part of a question are as shown

Use neat, large and well labeled diagrams where required
This paper consists of **THREE** printed pages

Question One

a) Define the following terms:
- **(i)** Chainage
- **(ii)** Survey station
- **(iii)** Baseline
- **(iv)** Proof line
- **(v)** Oblique offset **(5 marks)**

b) Briefly explain the chain surveying procedure. **(6 marks)**

c) With the aid of a sketch, explain the following chain surveying procedures.
- **(i)** Setting out a right angle by the 3:4:5 method **(5 marks)**
- **(ii)** Measuring a line across a pond without setting out right angles. **(4 marks)**

Question Two

a) The information shown in table 1 is for the measurement of a line in two bays. The tape measure was believed to be 50m long but of re-examination the tape was found to measure 49.970m only. Given the coefficient of expansion of the tape material as 0.00022 per^{o}C and the standard temperature as 20^{o}C, calculate the corrected length of the line: **(11 marks)**

Table 1			
	Length	Angle of slope	Day Temperature
Bay A	67.585	25^{o}C	32^{o}C
Bay B	61.087	17^{o}	34^{o}C

b) With the end of sketches, describe the following chain surveying procedures.

- **(i)** Step chaining **(4 marks)**
- **(ii)** Measuring a line over a small hill by the random line method. **(5 marks)**

Question Three

The following readings were recorded in the leveling exercise long the length of a proposed railway line 1.753, 1.850, 1.344, 1.723, 1.657, 1.990, 2.154, 2.005, 1.887, 2.575, 2.304, 1.075, 1.227, 1.014, 1252, 1.485, 2.257, 2.905 and all in meters. The leveling instrument was shifted after the 6th, 11th, and 14th readings. Given the reduced level of the first point as 27.528m. AMSL. Calculate the reduced levels of the other points by the rise and fall method applying the usual arithmetical checks. **(20 marks)**

Question Four

a) Define the following terms as used in theodolite works:
- **(i)** Changing faces
- **(ii)** Transiting
- **(iii)** Trannion axis

(iv) Line of collimation
(v) Swinging **(5 marks)**

b) Briefly explain the measurement procedures in theodolite work:
(i) Measurement of vertical angles
(ii) The repetition method of measuring horizontal angles. **(15 marks)**

Question Five

a) Differentiate between contour interval and contour line **(2 marks)**

b) With the aid of sketches, describe the following methods of contouring.
(i) Radial limes method **(6 marks)**
(ii) The Grid method **(12 marks)**