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 SURVEYING 1

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.

-Scientific calculator

This paper consists of five questions.

Attempt any THREE questions.

Do not write on the question paper.

Question One

(a) Using sketches explain the following methods of picking details in chain surveying

(i) Triangulation

(ii) Trilateration **(6 marks)**

(b) State FIVE factors considered before selecting survey stations **(5 marks)**

(c) With the aid of a sketch, describe the procedure for ranging a line over a hill **(9 marks)**

Question Two

(a)With the aid of a sketch explain the procedure of ranging a line where there is an obstacle to both ranging and chaining without setting out right angles . **(8 marks)**

(b) With the aid of a sketch briefly explain correction of an error using step chaining

method **(9 marks)**

(c) A chain of nominal length 20m measures 20.05 m when compared with standard length. If this chain is used to measure a length AB and the measurement recorded is 131.35 m, determine the true length of line AB **(3 marks)**

Question Three

a) Define the following as applied in leveling:-

(i) Horizontal line

(ii) Datum

(iii) Reduced level

(iv) Bench mark

(v) Spot height **(5 marks)**

b) Define the following terms as used in adjustments of the leveling instruments

(i) Temporary adjustment

(ii) Permanent adjustment **(4marks)**

c)Briefly describe temporary adjustments of dumpy level **(11 marks)**

Question Four

(a)When checking tilting level for collimation error, the level was set up midway between two staff stations A and B, 60m apart, staff reading on A is 2.850m and on B is 1.550m.The level was then shifted to point C, 20m behind B and in line AB . Staff reading on A and B are 3.750 and 1.850 respectively.

Calculate:-

(i) The amount and direction of collimation error

(ii) The true reading on staff at A and B from C

(iii) Explain adjustment procedure for the level **(10 marks)**

b) (i) Explain the essential difference between the Automatic level and other types of levels

(ii) Explain the parallax adjustment procedure for a level (**10 marks)**

Question Five

a) Explain the following errors in leveling

(i) Defect of staff

(ii) Unstable ground **(5 marks)**

b) The following is a series of leveling observations taken in a sequence starting on a bench mark with a reduced level of 300.00m. The instrument was moved after the third, sixth and eleventh readings.4.502, 1.928, 4.327, 0.315, 2.421, 1.519, 1.620, 3.672, 3.802, 4.925, and 0.982.

Prepare a level book form, enter the readings and reduce the readings by the rise and fall method, applying arithmetical checks **(15 marks)**