TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBCE 13J)

EBC 2103: ENGINEERING SURVEYING I

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: OCTOBER 2013
TIME ALLOWED: 2 HOURS

Instructions to Candidates:

You should have the following for this examination
- *Answer Booklet*
- *Scientific Calculator*

This paper consists of **FIVE** questions.
Answer any **THREE** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One

a) State **FOUR** uses of contour maps. **(4 marks)**

b) Describe the following types of leveling staffs:
    (i)   Single length
    (ii)   Folding
    (iii)   Telescopic **(6 marks)**

c) Show that correction for curvature and refraction in leveling is given by:

$$x = \frac{6}{7} \times \frac{d^2}{2R}$$

    Where d = Sight length

            R = Radius of earth **(10 marks)**

Question Two

a) Define the following terms as used in leveling:
    (i)   Contour line
    (ii)   Vertical interval
    (iii)   Horizontal equivalent **(3 marks)**

b) State **SEVEN** characteristics of contour **(7 marks)**

c) (i) Explain the procedure of leveling up a dumpy level

    (ii) State the basic requirement for a level **(10 marks)**

Question Three

a) Define the following terms:
    (i)   Chain survey
    (ii)   Survey line
    (iii)   Tie line/Prove line
    (iv)   Survey station
    (v)   Base line **(5 marks)**

b) Describe the following types of surveys:
    (i)   Plane
    (ii)   Geodetic
    (iii)   Engineering
    (iv)   Cadestral
    (v)   Aerial
    (vi)   Topographical **(9 marks)**

c) Differentiate between the following pair of terms:
   (i) Chainage and chaining
   (ii) Oblique offset and perpendicular offset   **(6 marks)**

Question Four

a) With the aid of a sketch, describe a method of ranging a line through a depression   **(7 marks)**

b) (i) Categorize chain surveying equipment according to the operations in which they are applied.

   (ii) Give **TWO** examples in each category (b) (i) above   **(6 marks)**

c) Define the following terms as used in surveying.

   (i)   Change point
   (ii)   Bench mark
   (iii) Back sight
   (iv)   Foresight
   (v)   Daturn surface
   (vi)   Level line
   (vii) Height of collimation   **(7 marks)**

Question Five

a) Reduce the levels shown below by the rise and fall method and apply arithmetical checks.
                                                                        (10 marks)

BS	IS	FS	REMARKS
3.200			BM 250.100M
	2.010		STATION A
	1.050		STATION B
3.250		0.650	STATION C
	2.980		STATION D
	1.500		STATION E
	2.200		STATION F
		0.680	STATION G

b) State **FOUR** sources of errors in leveling   **(4 marks)**

c) (i) State **THREE** classes of errors in chain surveying giving an example in each.

   (ii) After completing a survey exercise the 50m tape used was checked and found to read 49.050m

      long. Determine the corrected length of line AB observed to be 190.80m. The area of the site was

      calculated from the observed measurement as 4.250 ha, calculate the correct area. **(6 marks)**