



TECHNICAL UNIVERSITY OF MOMBASA
**Faculty of Engineering &
Technology**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING
DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBCE)

EBC 2102: ENGINEERING SURVEY I

END OF SEMESTER EXAMINATION

SERIES: AUGUST 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) Describe the following types of surveys:
- (i) Geodetic
 - (ii) Cadastral
 - (iii) Topographical
 - (iv) Aerial
- (6 marks)**
- b) Define the following terms used in chain surveying:
- (i) Base line
 - (ii) Survey station
 - (iii) Survey line
 - (iv) Tie line
- (4 marks)**
- c) Explain with the aid of a sketch, the process of chaining across a deep and wider river when the chain line is normal to the river banks
- (6 marks)**

Question Two

- a) Categorize chain surveying equipment according to operations in which they are applied.
- (3 marks)**
- b) With the aid of neat sketches, describe the following types of instruments:
- (i) Chain
 - (ii) Drop arrow
 - (iii) Ranging rod
- (9 marks)**
- c) The distance PQ on a sloping ground was chained and found to be 1256.320m. If the heights of points 'P' and 'Q' above mean sea level (MSL) are as shown in table 1 below.

Point	Height above MSL
P	1672.320
Q	1342.520

Calculate the horizontal distance

(4 marks)

- c) Define the following terms in site leveling:
- (i) Bench mark
 - (ii) Reduced level
 - (iii) Intermediate sight
 - (iv) Change point
- (4 marks)**

Question Three

- a) Define the following terms:
- (i) Contour line
 - (ii) Vertical interval
 - (iii) Horizontal equivalent
 - (iv) Spot height
- (4 marks)**

- b) State SIX characteristics of contours (6 marks)
- c) Explain with the aid of sketches, the grid method of contouring (10 marks)

Question Four

The following are staff readings taken along the centre line of a proposed road. The seventh and eighth readings were taken with the staff upside down:

1.20, 1.02, 22.05, 1.65, 2.25, 1.98, 2.50, 120, 0.68, 1.20, 2.60, 1.80, and 0.70

The first reading was taken with the staff held over a T.B.M (Temporary Bench Mark) of reduced level 200.50m.

The level was shifted after the 4th and 9th readings. Rule out a level book page, enter the readings and reduce them by the rise and fall method and apply arithmetical checks. (20 marks)

Question Five

- a) Define the following terms as used in theodolite:
- (i) Vertical axis
 - (ii) Transiting
 - (iii) Face left
 - (iv) Trunnion axis
 - (v) Centering (5 marks)
- b) Explain the procedure of leveling up a theodolite. (5 marks)
- c) Outline the procedure of the following angular measurement methods by the use of a theodolite:
- (i) Repetition
 - (ii) Reiteration (10 marks)