**MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**P.O. Box 972-60200 – Meru-Kenya.**

 **Tel: 020-2069349, 061-2309217. 064-30320 Cell phone: +254 712524293, +254 789151411**

**Fax: 064-30321**

**Website:** [**www.must.ac.ke**](http://www.must.ac.ke) **Email:** **info@must.ac.ke**

**University Examinations 2016/2017**

FIRST YEAR, FIRST SEMESTER EXAMINATION FOR THE DIPLOMA IN CIVIL ENGINEERING

**ECV 2101: ENGINEEERING SURVEY 1**

**DATE: DECEMBER, 2016 TIME: 11/2 HOURS**

**INSTRUCTIONS: -** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. (i) Define the term engineering survey. (2 Marks)

(ii) State any three types of errors in surveying. (3 Marks)

(iii) Name atleast three types of levels used in engineering surveying. (3 Marks)

(iv) State and describe any three methods used in horizontal measurement. (9 Marks)

(v) Explain how you would carry out the following measurements- use clear sketches.

1. Measure a line across a river of width 40m. (5 Marks)
2. Measure a line across a 20 m p.d. (5 Marks)

(vi) Differentiate between the following two terms traverse and traversing. (3 Marks)

**QUESTION TWO (15 MARKS)**

1. Define the following terms as used in lavelling;
2. Station (2 Marks)
3. Height of the instrument (HI) (2 Marks)
4. Back light (2 Marks)
5. Intermediate light (2 Marks)
6. Fore station (2 Marks)
7. Briefly differentiate between the two methods of lavelling;
8. Rise and fall method (2$½$ Marks)
9. Collimation method (2$½$ Marks)

**QUESTION THREE (15 MARKS)**

1. Define the term traverse surveying. (2 Marks)
2. By way of simple labelled diagrams illustrate any three types of traverse. (9 Marks)
3. State the roles of the following chairmen.
4. Followers (2 Marks)
5. Leaders (2 Marks)

**QUESTION FOUR (15 MARKS)**

1. (i) State any three general methods for calculating earthworks. (3 Marks)

(ii) Briefly describe any of the methods stated above. (4 Marks)

1. At a certain station, an embarkment formed on level ground has a height at its centreline of 3.10 metres. If the breadth of formation is 12.50 metres, find;
2. The side widths (4 Marks)
3. The area of cross section, given that the side slope is 1 vertical to 2½ horizontal

 (4 Marks)