

**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**](mailto:info@must.ac.ke)

**University Examinations 2015/2016**

SECOND YEAR SECOND SEMESTER EXAMINATION

FOR DIPLOMA IN

CIVIL ENGINEERING

**ECV 2154: ENGINEERING SURVEY II**

**DATE: APRIL 2016 TIME: 1 ½ HOURS**

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

**QUESTION ONE (30 MARKS)**

1. State any three differences between a vermier-theodolite and a modern optical reading theodolite. (3 marks)
2. Define the following terms as used in surveying:
3. Traverse
4. Traverse station
5. Tacheometry
6. Booking
7. Frequency (5 marks)
8. With an aid of a diagram explain the three types of theodolite traversing (9 marks)
9. Differentiate between the following terms:
10. Magnetic bearing and quadratal bearing. (2 marks)
11. Stadio tachometry and horizontal staff tachometry. (2 marks)
12. Define the term Electromagnetic distance measurement (EDM) as used in surveying

(1 mark)

1. State four properties electromagnetic waves. (4 marks)
2. State any four factors that can be considered in determining the best position for the ‘balancing line’ in mass haul diagram (4 marks)

**QUESTION TWO (15 MARKS)**

1. Define the following terms as used n earth works.
2. Borrow
3. Bulking
4. Shrinkage
5. Waste (4 marks)
6. State any four application of EDM to civil engineering (2 marks)
7. Stating any relevant consideration, explain why reconnaissance survey is necessary before carrying out theodolite traversing. (9 marks)

**QUESTION THREE (15 MARKS)**

1. Define the term ‘setting out as used n construction works (2 marks)
2. State any three conditions and requirements that are pre-liquisite to any setting out process. (3 marks)
3. List any three conditions and requirements that are necessary during the setting out process (4 marks)
4. Two primary control points A and B have co-ordinates 1000.00 mE, 2000.00mN and 986.72mE, 1897.46mN respectively. Calculate data set out point S, 1025.00mE, 1950.00mN by two measurements. (6 marks)

**QUESTION FOUR (15 MARKS)**

1. State any three general methods for calculating harth works (3 marks)
2. At a certain station, an embankment formed on level ground has a length at its centre line of 3.10 meters. If the breadth of formation is 12.50 meters, find
3. The side widths
4. The area of cross-section, given that the side slope is 1 vertical to 2 ½ horizontal. (4 marks)
5. Calculate the side widths and cross sectional area of an embankment to a road with formation width of 12.50 meters and slopes 1 vertical to 2 horizontal, when the centre height is 3.10 meters and existing ground has a cross fall of 1 in 12 at right angles to the centre line of the embankment. (8 marks)