

**MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY**

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**University Examinations 2014/2015**

FIRST YEAR, SECOND SEMESTER EXAMINATION FOR DIPLOMA IN ELECTRICAL ENGINEERING

**EEE 2154: ELECTRICAL MEASUREMENTS & TESTING I**

**DATE: AUGUST, 2015 TIME: 3 HOURS**

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

**QUESTION ONE – 30 MARKS**

1. Distinguish between an absolute and secondary measuring instrument giving one example of each. (6 Marks)
2. With the aid of suitable circuits show how the following types of instruments are connected, stating quantity and units used by each in measurement.
3. A d.c voltmeter (3 Marks)
4. A.c ammeter (3 Marks)
5. Multimeter (3 Marks)
6. Draw labeled diagrams of the following types of moving iron instruments;
7. Repulsion (5 Marks)
8. Attraction (5 Marks)
9. State any three advantages and two disadvantages of permanent magnet moving coil types of instruments. (5 Marks)

**QUESTION TWO (15 MARKS)**

1. Briefly explain the following methods of measurements giving one example of each;
2. Direct (3 Marks)
3. Indirect (3 Marks)
4. With the aid of a labeled diagram explain the principle of operation of a permanent magnet moving coil type of instrument. (9 Marks)

**QUESTION THREE (15 MARKS)**

1. (i) State any two merits of a rectifying type of instruments. (2 Marks)

(ii) With the aid of a constructional arrangement diagram explain the principle of operation of electrostatic instruments. (4 Marks)

1. Briefly explain the following types of forces developed in measuring instruments and state the devices used to develop them;
2. Dampling (3 Marks)
3. Controlling (3 Marks)
4. Deflecting (3 Marks)

**QUESTION FOUR (15 MARKS)**

1. (i) Define a digital multimeter and state one application of this instrument, (2 Marks)

(ii) Draw a labeled block diagram of cathode Ray oscilloscope and briefly explain its operation. (9 Marks)

1. Define instrument calibrations and state any three basic steps for correcting instrument for bias and surrogates for other measurements situations. (4 Marks)