

**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 FIRST SEMESTER EXAMINATION

FOR THE DEGREE OF

BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING

**EMT 3255: ELECTRONICS**

**DATE: APRIL 2016 TIME: 2 HOURS**

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

**QUESTION ONE (30 MARKS)**

1. Distinguish between intrinsic and extrinsic semiconductors. (2 marks)
2. State two types of n-type impurities (2 marks)
3. Explain the term ‘Zener effect’ (2 marks)
4. Define the term rectification (2 marks)
5. Draw a common collector configuration circuit of an NPN transistor (3 marks)
6. State three advantages of negative feedback (3 marks)
7. Draw a truth table for a 2-input NOR logic gate. (4 marks)
8. State any THREE types of Flip – Flops (3 marks)
9. Define the term instruction set as used in microprocessors (2 marks)
10. Convert (500)10 to binary (4 marks)
11. State any THREE applications of microprocessors (3 marks)

**QUESTION TWO (20 MARKS)**

1. With the aid of a circuit diagram and waveforms, explain the operation of a full wave rectifier. (10 marks)
2. Sketch the input characteristics of a CE amplifier (3 marks)
3. With the aid of waveforms, distinguish between class A and class B amplifiers (7 marks)

**QUESTION THREE (20 MARKS)**

1. Perform the following number conversions
2. (1 1 0 1 1 0)2 to decimal
3. (1 1 0  0 1 1 )2 to decimal (6 marks)
4. Draw the truth-table for the following logic circuit (8 marks)

DIAGRAM

1. Define the term flip-flop (2 marks)
2. Distinguish between half adder and full adder (4 marks)

**QUESTION FOUR (20 MARKS)**

1. With the aid of a block diagram, describe the element of a microcomputer (8 marks)
2. State any THREE addressing modes used in 8085 Microprocessor. (3 marks)
3. Write a simple assembly language program to add numbers 20 and 30 and store the result in register C. (9 marks)