

**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 2153: ELECTRONICS I**

**DATE: AUGUST, 2015 TIME: 1**$½$ **HOURS**

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

**QUESTION ONE – 30 MARKS**

1. Define the terms; (4 Marks)
2. Energy band
3. Valence band
4. State two conditions to be satisfied for the transistor action to take place. (2 Marks)
5. State and explain two methods of transistor biasing. (6 Marks)
6. With aid of a diagram, explain the construction and operation of SCR. Draw the V.I characteristics. (6 Marks)
7. Derive the relationship between $∝$ and $β$ in transistor biasing. (4 Marks)
8. With sketches, explain difference between an insulator and semi-conductor. (4 Marks)
9. Outline three applications of a common collector configuration circuit. (3 Marks)
10. State one disadvantage of full wave rectifier. (1 Mark)

**QUESTION TWO ( 15 MARKS)**

1. Define the term; (4 Marks)
2. Doping
3. Matter
4. State two remedies of thermal runaway in amplifier. (2 Marks)
5. With aid of a circuit, explain the operation of a single ended transformer coupled class A amplifier. (6 Marks)
6. Transistor has hfb of 0.97. Calculate the corresponding hfe. (3 Marks)

**QUESTION THREE (15 MARKS)**

1. With aid of a circuit diagram and waveforms explain the operation of center-tapped transformer rectifier. (8 Marks)
2. For the circuit below, draw the d.c load line and locate the d.c working point. Assume

$β$= 100 and neglect VBE (7 Marks)

**QUESTION FOUR (15 MARKS)**

1. Define the following terms; (4 Marks)
2. Holding current
3. Zener effect
4. State the main function of emitter terminal of a transistor. (2 Marks)
5. With aid of a diagram and characteristics, explain the operation of UJT. (9 Marks)