MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

FIRST YEAR FIRST TERM EXAMINATION FOR

CERTIFICATE IN INFORMATION COMMUNICATION TECHNOLOGY

1602/102 ELECTRICAL PRINCIPLES I

DATE: 3/6/2021 **TIME: 11.30-2.30 PM**

INSTRUCTIONS

Answer all the questions

1 a) State ohms law and give the formula (2 marks)

b) Draw the structure of

i. Silicon

ii. Chlorine

iii. Boron atoms (6 marks)

c) Explain the following terms as applied in conductors

i. Atomic structure

ii. Valence (6 marks)

Two resistors each of RΩ are connected in parallel. Show that their effective equivalent resistance is R/2 Ω (6 marks)

2. a) i Find the conductance of a conductor of resistance of 5KΩ (4 marks)

ii Two 40Ω resistors are connected in parallel. The combination is then connected in series to a cell of 50V. If the cell has internal resistance of 5 Ω, calculate,

I. The total current flowing

II. The energy consumed by one resistor in 30 minutes 55 seconds by one resistor (6 marks)

b) i Explain what doping means in electronics (4 marks)

ii Explain how N-type semiconductor material is achieved (6 marks)

3. a) Define, and give an example, a semi-conductor (2 marks)

b) Explain what is meant by the following in electronics

i. Negative temperature coefficient

ii. Trivalent material

iii. Doping

iv. P-N junction

v. Depletion region (10 marks)

c) Explain two reasons responsible for reverse bias breakdown (8 marks)

4. a) In the circuit given below Calculate

i. the current flowing

ii. the power dissipated in one of the resistors. (10 marks)