# MACHAKOS UNIVERSITY

**University Examinations for 2020/2021 Academic Year**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**SECOND YEAR SPECIAL/SUPPLIMENTARY EXAMINATION FOR**

**DIPLOMA IN ELECTRICAL ENGINEERING**

**POWER ELECTRONICS**

**DATE: 25/3/2021** **TIME: 2.00-4.00 PM**

**INSTRUCTIONS**

**Answer Question One and any Other Two Questions**

***Neat weak required***

**QUESTION ONE (30 MARKS)**

a) Define the following Electronic Components

i. Power Diode

ii. Photo Diode

iii. Light Emitting Diode (LED)

iv. Varactor Diode

v. Pin Diode (10 marks)

b) In any THREE of the diodes in Q1(a) explain their respective operations (9 marks)

c) Optic fibre cable Technology is the most advanced system all over would today describe its functions (11 marks)

**QUESTION TWO (20 MARKS)**

a) Differentiate Silcon controlled rectifiers (SCRs) and power diodes (4 marks)

b) With an aid of characteristics curves explain the operation of an SCR (10 marks)

c) Define the following

Demodulation in communication electronics (6 marks)

**QUESTION THREE (20 MARKS)**

a) Explain briefly an operational Amplifier (OPAMP)

b) Show how an OPAMP is connected in an electronic circuit (10 marks)

c) Describe a cyclo converter in A.C Circuit (10 marks)

**QUESTION FOUR (20 MARKS)**

a) Briefly explain the following circuits

(i) Analogue circuits

(ii) Digital circuits (8 marks)

b) Analyze how a signal is processed in a digital and vice –versa (10 marks)

c) State any TWO applications of analogue to digital converters ( A/D) (2 marks)

**QUESTION FIVE (20 MARKS)**

a) Filters are divided into any two of them (4 marks)

b) Explain any THREE types of filters applied in the electrical Engineering Industry (9 marks)

c) State any FOUR advantages of using optic fibres in communication Engineering (7 marks)