



# MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SECOND YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

DIPLOMA IN ELECTRICAL ENGINEERING

POWER ELECTRONICS

DATE: 25/3/2021

TIME: 2.00-4.00 PM

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## INSTRUCTIONS

Answer Question One and any Other Two Questions

*Neat work required*

### QUESTION ONE (30 MARKS)

- a) Define the following Electronic Components
- Power Diode
  - Photo Diode
  - Light Emitting Diode (LED)
  - Varactor Diode
  - 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 world today describe its functions (11 marks)

### QUESTION TWO (20 MARKS)

- a) Differentiate Silicon 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)