



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

FIRST YEAR THIRD SEMESTER EXAMINATION FOR

DIPLOMA IN ELECTRICAL ENGINEERING

ANALOGUE ELECTRONICS I.

DATE: 14/12/2020

TIME: 8.30-11.30AM

INSTRUCTIONS TO CANDIDATES

This paper consists of FIVE QUESTIONS

Answer ALL Questions.

All questions carry equal marks and maximum marks for each part of a question are shown.

QUESTION ONE (20MARKS)

- a) Define the following terminologies;
 - i. Power diode
 - ii. LED
 - iii. Photo diode
 - iv. Photo Multiplier
 - v. Laser diode (10 marks)
- b) Show how a transistor is used as an amplifier. (5 marks)
- c) With the aid of symbols differentiate between BSTs, FETs and UJT. (5 marks)

QUESTION TWO (20 MARKS)

- a) Explain briefly;
 - i. Harmonic distortion
 - ii. Cross-over modulation
 - iii. Intermodulation (8 marks)
- b) Describe the three classes of operating an amplifier. (12 marks)

QUESTION THREE (20 MARKS)

- a) Show how sine wave form is displayed on an oscilloscope. (4 marks)
- b) The trace displayed by a CRO shows a signal amplitude control set to 0.5V/cm and the time base control to 100 μ s/cm. If the height of display is 4.6cm while the equivalent period is 7cm, determine;
- Peak to peak voltage
 - Frequency of the signal. . (12 marks)
- c) Differentiate between direct measurement of a signal in a CRO and RMS signal measurement. (4 marks)

QUESTION FOUR (20 MARKS)

- a) Show how a beam is deflected in a cathode ray tube (CRT). (5 marks)
- b) Describe the principal features of a cathode ray tube (CRT). (15 marks)

QUESTION FIVE (20 MARKS)

- a) Explain a cascaded system. (5 marks)
- b) With the aid of a labeled circuit diagram explain a two stage transistor amplifier (8 marks)
- c) State any three applications of transistors. (3 marks)
- d) Show how an electromagnetic signal is intercepted into a ferrite coil. (4 marks)