



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

DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

ANALOGUE ELECTRONICS

DATE: 3/6/2021

TIME: 8.30-11.30 PM

INSTRUCTIONS

i. Answer all Questions

ii. Neat work required

1.
 - a) Define the following Electronic Terms / Devices
 - i. Power Diode
 - ii. Light Emitting Diode (LED)
 - iii. Photo Diode
 - iv. Biasing
 - v. Frequency (10 marks)
 - b) With an aid of labeled diagrams explain NPN and PNP transistors respectively (5 marks)
 - c) Show how a Bipolar Junction transistor is used as an Amplifier (5 marks)
2.
 - a) Explain both intrinsic & Extrinsic semi- Conductors (4 marks)
 - b) Sketch the output voltages of both half – wave and full wave diode rectifiers (8 marks)
 - c) State any **FOUR** applications of the circuits in Q2 (b) (8 marks)
3.
 - a) What is a Radio frequency (2 marks)
 - b) Define the following as applied in Telecommunication engineering

- i. Amplitude modulation (AM)
 - ii. Frequency modulation (FM) (10 marks)
- c) Describe the process of ground wave propagation (8 marks)
- 4. a) Show how Am signals are transmitted through the ionosphere (3 marks)
- b) A transmitting station uses a carrier frequency of 1MHZ and a modulating frequency of 1KHZ. If the b and width followed is 10KHZ, calculate the range of frequencies radiated by the station for broadcasting (8 marks)
 - c)
 - i List any **FOUR** advantages of FM over Am signals (8 marks)
 - ii Mention ONE advantage of AM broadcasting (1 mark)
- 5. a) With an aid of labeled diagrams differentiate
 - i. n- channel JFET
 - ii. p-channel JFET (4 marks)
- b) State an application of a dual JFET (2 marks)
- c) Show how a current flows in an n-channel JFET (3 marks)
- d) Describe a cathode Ray Oscilloscope (CRO) (11 marks)