



MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

BUILDING AND CIVIL ENGINEERING DEPARTMENT

FIRST YEAR FIRST TERM EXAMINATION FOR

DIPLOMA IN ELECTRICAL AND ELECTRONIC ENGINEERING

ANALOGUE ELECTRONICS

DATE:30/11/2021

TIME: 2:30 – 5:30 PM

INSTRCUTIONS

- (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 circuit in Q2 (b) (8 marks)
3.
 - (a) What is a Radio frequency (2 marks)
 - (b) Explain the following as applied in Telecommunication engineering
 - (i) Oscillatory Frequency
 - (ii) Three classes of Amplifier operations. (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) List any **FOUR** advantages of FM over Am signals (8 marks)
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 (4marks)
 - (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) (11marks)