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

ELECTRICAL MEASUREMENTS AND TESTING

DATE: 24/3/2021 **TIME: 2.00-4.00 PM**

INSTRUCTIONS

Answer Question One and any Other Two Questions

QUESTION ONE (30 MARKS)

a) Define the process of measurement of system (3 marks)

b) State Two requirements of a measurement system (2 marks)

c) Explain the significance of measurement (4 marks)

d) Describe the following instruments

i. Mechanical instruments

ii. Electrical instruments

iii. Electronic instruments (12 marks)

e) With an aid of labeled block diagrams explain the functions of an instrumentation system (9 marks)

QUESTION TWO (20 MARKS)

a) With an aid of labeled diagram explain

i. An ammeter

ii. Voltmeter instruments (10 marks)

b) A meter of internal resistance 6Ω is supposed to measure 20V.If the full-scale deflection current is 10㎃A, find the p.d across the millimeter and the multiplier required to be connected in order to meet the conditions. (10 marks)

QUESTION THREE (20MARKS)

a) Define

i. LED

ii. Photo Diode

iii. Amplifier

iv. Oscillator

v. Thermometer (8 marks)

b) With an aid of labeled diagrams explain how a signal is modulated and transmitted to far off distances. (7 marks)

c) Describe a kicking wire experiments. (5 marks)

QUESTION FOUR (20 MARKS)

a) What is an Aerial? (2 marks)

b) Briefly explain how radio waves are propagated into the space (5 marks)

c) Describe the radiation pattern of an aerial (8 marks)

d) Differentiate between indoor antenna and built-in antenna (5 marks)

QUESTION FIVE (20 MARKS)

a) Explain the process of installing a television Antenna (5 marks)

b) With an aid of labeled diagrams, explain the operation of a multi- channel Aerial (8 marks)

c) Explain the following

i. Aerial Gain

ii. Bean width

iii. Front to Back Ratio (7 marks)