



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

FIRST SEMESTER EXAMINATION FOR DIPLOMA IN ELECTRICAL AND
ELECTRONICS ENGINEERING

EED 209: ELECTRICAL MEASUREMENTS AND TESTING II

DATE: 10/8/2016

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

1. Question 1 compulsory
2. Do any other TWO questions.

QUESTION ONE: (COMPULSORY) (30 MARKS)

- (a) Define the process of measurement of systems. (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) State TWO factors that determine the choice of display devices and recorders. (4 marks)
- b) Give any FIVE advantages of magnetic tape recorders (10 marks)
- c) Explain any FOUR components of a tape recorder (6 marks)

QUESTION THREE (20MARKS)

- a) State THREE advantages and disadvantages of pulse duration modulation (PDM) recording. (6 marks)
- b) The Gap of a Recorder is $6.25 \mu\text{m}$. Determine the speed of the tape so as to have at satisfactory response at $50,000\text{Hz}$. Assume that recorder wave length must be greater than 2.5 times the gap of the recorder (5 marks)
- c) A tape receives 12,000 numbers per second . The tape speed is 1.5 m/s . Determine the number density of the tape (5 marks)
- d) Explain the operation of an operational Amplifier. (4 marks)

QUESTION FOUR (20 MARKS)

- a) Describe a digital frequency meter. (10 marks)
- b) Explain how high frequency measurements is done. (8 marks)
- c) The number of counts displayed in an output device is 100. If it takes 10 seconds for the process, find the frequency of un- known signal. (2 marks)

QUESTION FIVE (20 MARKS)

- a) Mention TWO major classes of data acquisition (2 marks)
- b) With an aid of labeled diagram, explain a data acquisition system (8 marks)
- c) Describe a translational encoder (10 marks)