



MACHAKOS UNIVERSITY

University Examinations for 2016/2017

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SECOND YEAR SEMESTER EXAMINATION FOR DIPLOMA IN ELECTRICAL AND
ELECTRONICS ENGINEERING

EED 213: ELECTRICAL MEASUREMENTS III

DATE: 6/6/2017

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

Answer Question One and Any Other Two Questions

QUESTIONS ONE (COMPULSORY) (30 Marks)

- a) What is an instrument. (2 marks)
- b) Explain a Bourdon Tube for measurement of pressure. (8 marks)
- c) Describe THREE methods applied in a measurement, systems (12 marks)
- d) With an aid of labeled diagrams, explain the operation of a Linear Variable Differential Transformer (LVDT) (8 marks)

QUESTION TWO (20 MARKS)

- a) Differentiate between analogue and digital systems. (6 marks)
- b) With an aid of block diagrams explain how a signal is processed in an analogue instrumentation system. (8 marks)
- c) Explain briefly an analogue digital converter (A/D) (3 marks)
- d) List and THREE applications of digital systems (3 marks)

QUESTION THREE (20 MARKS)

- a) Explain the following :
 - (i) Telemetry
 - (ii) Transmitter
 - (iii) Wave – Length
 - (iv) Angular velocity
 - (v) Optic fibre cables (12 marks)
- b) With an aid of labeled diagrams, explain a single stage transformer (5 marks)
- c) A transformer has 500 primary turns and 3000 secondary turns. If the primary voltage is 240v, Determine the secondary voltage assuming an ideal transformer (3 marks)
- d) List any THREE applications of digital systems. (3 marks)

QUESTION FOUR (20 MARKS)

- a) What is a manometer? (2 marks)
- b) With an aid of labeled diagrams explain how a manometer is used in measurement of Gas pressure. (6 marks)
- c) Describe the process of refrigeration (12 marks)

QUESTION FIVE (20 MARKS)

- a) Explain the working of a capacitor (2 marks)
- b) Derive expressions for
 - i. Series Capacitors
 - ii. Parallel capacitors (12 marks)
- c) Explain the following terms as applied in capacitors
 - i. Electric field strength
 - ii. Electric flux density
 - iii. Permittivity (6 marks)