



MACHAKOS UNIVERSITY

University Examinations 2016/2017

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

THIRD YEAR EXAMINATION FOR DIPLOMA IN ELECTRICAL AND
ELECTRONICS ENGINEERING

SUPPLEMENTARY EXAMINATION

EED 216: POWER ELECTRONICS

DATE: 31/8/2017

TIME: 2:00 – 4:00 PM

Instruction to the candidates

1. Question **One** is Compulsory
2. Do any **TWO** Questions from the eight given questions

QUESTION ONE (30 MARKS)

- (a) Define the following electronic circuits
 - (i) Integrator
 - (ii) Differentiator (4 marks)
- (b) With an aid of labeled diagram (s) explain the operation of an integrator circuit (6 marks)
- (c) Describe a digital to analogue converter circuit (10 marks)

QUESTION TWO (20 MARKS)

- (a) Differentiate between digital analogue converters (8 marks)
- (b) With the aid of block diagrams explain how data is acquired in an electronic system (10 marks)

- (c) Explain the function of a frequency counter (2 marks)

QUESTION THREE (20 MARKS)

- (a) Logic gates are widely used in analogue to digital converters, with aid of labeled diagrams show a complete conversion process (7 marks)
- (b) Explain how a digital signal is obtained from a voltage to frequency converter (8 marks)
- (c) State an application of the following converters
- (i) Digital to analogue
 - (ii) Analogue to Digital (5 marks)

QUESTION FOUR (20 MARKS)

- (a) Describe the operation of a thyristor device. (10 marks)
- (b) Mention any two applications of thyristors (2 marks)
- (c) An oscillator is an electronic device which uses negative feedback with an aid of diagrams explain how it produces output. (8 marks)

QUESTION FIVE (20 MARKS)

- (a) Describe a cyclo converter (15 marks)
- (b) State TWO application of cyclo – converters in DC motor drives. (5 marks)