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

SECOND SEMESTER EXAMINATION FOR DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

EED 216: POWER ELECTRONICS

DATE:8/8/2016 **TIME: 2:00 – 4:00 PM**

INSTRUCTION TO THE CANDIDATES

1. **Question 1 Compulsory**
2. **Do any other 2 questions**

QUESTION ONE (COMPULSORY) (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 (7 marks)

(c) Describe a digital to analogue converter circuit. (10 marks)

(d) With the aid of block diagrams explain how data is acquired in an electronic system. (9 marks)

QUESTION TWO (MARKS)

a) Differentiate between digital analogue converters (8 marks)

b) A voltage to time (A/D) converter is also referred as a feedback circuit. . With aid of block diagrams, explain it's operational. (10 marks)

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

QUESTION THREE (20 MARKS)

a) Logic gate 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) With the aid of a circuit diagrams, explain an inverter as applied in engineering work. (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 devise which uses negative feedback with any aid of diagrams explain how it produces output. (8 marks)

QUESTION FIVE (20 MARKS)

a) State TWO applications of cyclo – converters in DC motor drives. (2 marks)

b) Describe a cyclo converter (15 marks)

c) A unipolar junction transistor (UJT) oscillator has the following values RE=10K, nitter(∫) = 0.75. If the required oscillator frequency is 1KHZ. Find the value of capacitor C given the value of the constant K= 1.4 (3 marks)