MACHAKOS UNIVERSITY

University Examination 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

CERTIFICATE IN ELECTRICAL AND ELECTRONIC ENGINEERING (TVET)

1601/102: ELECTRONICS

DATE: 18/4/2019 **TIME: 2.30-5.30 PM**

INSTRUCTIONS:

Answer question one and any other two questions

QUESTION ONE (30 MARKS)

a) Convert the following binary numbers i) 11001.11

   i. 11100

   ii. 11111.101 to decimal.

b) Convert the following decimal numbers i)45,

   i. 273,

   ii. 946,

   iii. 380 to binary

c) Convert the following hexadecimal numbers i) BF2 ,ii) 4D7E iii) 3BB1 iv) 96DA to binary

d) Convert the binary number

   i. 11011100,

   ii. 11100011 to hexadecimal

QUESTION TWO (20 MARKS)

a) Convert the following decimal numbers i) 20, ii) 345 ,iii) 654, iv) 1000 to octal

b) Convert the following octal numbers i) 367 ii) 342 iii) 471 iv) 23 to hexadecimal

c) Convert

i. $(1001)_{BCD}$

ii. $(100100)_{BCD}$to Excess-3.

d) Convert the following numbers in binary

i. 111100

ii. 1101100 to BCD

QUESTION THREE (20 MARKS)

a) Perform the following functions

i. 1111001+110001

ii. 111X101

b) Using two's compliment perform the following

i. 1010-1100

ii. 1100-1110

QUESTION FOUR (20 MARKS)

Draw the logic circuit and the truth table for a three input logic circuit.

a) $F=\overline{AB}CD+\overline{ABCD}+ABCD$

b) $F=\overline{AB}+ ABCD +AB\overline{CD}$

QUESTION FIVE (20 MARKS)

Minimize the following Boolean expressions

a) $F = \overline{AD}+ABCD+\overline{ABCD}$

b) $\overline{F} = AB\overline{CD}+ABCD+ABCD$