MACHAKOS UNIVERSITY COLLEGE

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

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SECOND SEMESTER EXAMINATION FOR DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

EED 205: DIGITAL ELECTRONICS

DATE: 1/8/2016 **TIME: 8:30 – 10:30 AM**

INSTRUCTIONS TO CANDIDATES:

Answer question ONE and any other TWO questions

SECTION ONE

1. a) Find the decimal equivalent of the following

   i) 100.101

   ii) 101.101

   iii) 1111 (7.5 marks)

   b) Find the binary equivalent of the following decimal nos.

   i) 25

   ii) 25.625

   iii) 37 (7.5 marks)

   c) Add the following binary numbers 110011+101101 ii) 11111+10101 (7.5 marks)

d) Subtract the following numbers 0101- 1110 ii) 11110-11100 iii) 10101-10011 (7.5 marks)

SECTION B

2. a) Use 2's compliment to subtract 1010 from 1101, ii)1101 from 1010 (5 marks)

b) Multiply the following binary numbers 1101 by 1100 ii)111 by 101 (5 marks)

c) Divide 11001 by 101 ii) 11011 by 100 (5 marks)

d) Convert the following octal to decimal i) 206 ii) 347 (5 marks)

3. a) Convert these octal numbers to binary i) 375 ii) 56643 (5 marks)

b) Convert these Hexadecimal numbers to binary 23A ii) 67BD (5 marks)

c) Convert these Hexadecimal to Decimal i) 7BF ii) F6D9 (5 marks)

d) Find the 1's compliment of the following numbers i) 01101 ii)1101 (5 marks)

4. a) Map the following standard sum of products expression on a Karnaugh Map

$\bar{A}\bar{B}\bar{C}D+A\bar{B}\bar{C}D+A\bar{B}C\bar{D}+A\bar{B}CD+AB\bar{C}D+ABC\bar{D}+ABCD$ (10 marks)

b) Map the following non-Standard sop in a Karnaugh Map $A+AB+ABC$

Minimize and draw the final logic circuit (10 marks)

5. a) Simplify the following Boolean expression using Karnaugh Map Technique

$\bar{X}= AB+\bar{A}BC+\bar{A}B\bar{C}+ABC+BC$ (10 marks)

b) Simplify the following sop expression using the Karnaugh Technique

$X=\bar{A}B\bar{D}+ABC+CD$ (10 marks)