	COURSE: COMPUTER ARCHITECTURE & ORGANIZATION		
	TOPIC: Chapter 2,3	**CODE:** BCN1043	
	ASSESSMENT: Assignment		

Instructions to students

- Choose your group. Each group should select the Group Leader
- Group leader should manage the distribution of the tasks among team members.
- Group leader should have the ability to plan; coordinate; give clear instructions
- The task distribution or the role / individual contribution of each student must be clearly stated in the assignment report.
- The group leader is responsible for submission before due date in lecturer's office
  The front page of the assignment report must clearly display the Subject details, Student details: Section Name, Group leader name, matric number, team members)
- You will be evaluated and marks will be given based on how well and detail the calculations and explanations are provided in the assignment
  All the above will be considered for students' performance evaluation in assignment

Section 1. (CO2: 25marks, CO3: 25m) Convert the following numbers:

No.	Decimal	Binary	Octal	Hexadecimal
1			$(67)_8$	
2	$(534)_{10}$			
3		$(11100.1001)_2$		
4				$(DEAD.BEE)_{16}$
5	$(9714)_{10}$			
6			$(26.24)_8$	
7		$(101101.01101)_2$		
8				$(BC1.30)_{16}$
9	$(153.5)_{10}$			

10			$(127.4)_8$	
11		$(10111.0111)_2$		
12				$(B65F)_{16}$
13	$(109.375)_{10}$			
14		$(1011110101.010)_2$		
15			$(273.4)_8$	

Section 2.   (CO2: 25m, CO3: 25m)

(a) Design the digital circuit using logisim for the following Boolean expressions.

(b) Simplify the following Boolean functions using (i) Boolean Laws and (ii) Karnaugh's Map

1.   F=xy + xy'
2.   F=ABC + A'B + ABC'
3.   F=xyz' + x'yz + xyz + x'yz'
4.   F=xy + x'z + yz
5.   F=(BC' + A'D) (AB' + CD')
6.   F=x'yz + xz

(c) For the following problems, determine the Boolean expression and Truth table. (Hint: Convert the below one or more English sentences into Boolean equations)

1.   An alarm circuit is to be designed which operates as follows:
    The alarm will ring if the alarm switch is turned on and the door is not closed, or it is after 6p.m and the window is not closed.

2.   The air conditioner should be turned on if the temperature is greater than 75º F, the time is between 8 a.m and 5 p.m, and it is not a holiday.

3.   Mary watches TV if it is Monday night and she has finished her homework.