NATIONAL OPEN UNIVERSITY OF NIGERIA
14/16 AHMADU BELLO WAY, VICTORIA ISLAND, LAGOS
SCHOOL OF SCIENCE AND TECHNOLOGY
JUNE/JULY EXAMINATION

COURSE CODE: CIT344
COURSE TITLE: Introduction to Computer Design
TIME ALLOWED: 3hrs
INSTRUCTION: Answer any five (5) questions.

QUESTIONS

1a. List and describe the three (3) main forms of flash memory operations. (12 marks)

1b. Write down the instruction required to move data from one segment of a register 'ecx' to another 'edx'. (2 marks)

2. Study the table provided below carefully as it will serve as your reference in answering the questions afterwards:

A	B	C_{in}	Sum	C_{out}
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

2a.State the key role of this table within the context of computer design. (4 marks)

2b.Draw a well-labelled diagram to depict the circuit implementation of this table. (10marks)

3a. Write down any four (4) forms of notations that can be used to capture the behaviour of finite-state machines. (4 marks)

3b. Write short notes on the following:

i. Memory Read Operation (4 marks)
ii. Data Signals (4 marks)
iii. Read/Write Signals (2 marks)

4a. Distinguish between the two (2) common types of sequential circuits. (4 marks)

4c. Find the sum of two 2-digit BCD numbers, 23 and 45. Your result should be in BCD. (10 marks)

5. Go through the table below and answer the questions that follow:

Input		**Output**
S	**R**	**Q_{t+1}**
0	**0**	**Invalid**
0	**1**	**1**
1	**0**	**0**
1	**1**	**Q_t**

5a. Write the value of the output Q, when S = 0 and R = 1 (4 marks)

5b. Write the full meaning of S-R in the context of NAND-based latches (2 marks)

5c. What is the next state output, when the inputs are S=1 and R =1? (4 marks)

5d. What does the Output Qt+1 represent? (4 marks)

6a. If ebx contains 1000h and esi contains 4, specify the function of the following instructions:

i. mov al,1000h[ebx][ebx*2] (4 marks)
ii. mov al,1000h[esi*8] (4 marks)
iii. mov al,8[ebx][esi*4] (2 marks)

6b. Give the standard format for assembly language statements in a typical source file. (4 marks)

7. List and describe the internal components of a typical microprocessor that executes programs which include operating systems and user applications..