NATIONAL OPEN UNIVERSITY OF NIGERIA
14-16 AHMADU BELLO WAY, VICTORIA ISLAND LAGOS
SCHOOL OF SCIENCE AND TECHNOLOGY
MAY/JUNE 2012 EXAMINATION

CIT 344 INTRODUCTION TO COMPUTER DESIGN (3 CR)
TIME ALLOWED: 3HRS

INSTRUCTIONS: Answer any **five (5)** questions.

1a. Give a brief explanation of how sequential circuits are implemented, using a well-labelled block diagram to illustrate this. (8 marks)

1b. Distinguish between the two (2) common types of sequential circuits. (4 marks)

1c. Find the sum of two 2-digit BCD numbers, 23 and 45. Your result should be in BCD. (8 marks)

2. 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**

2a. Specify what this table depicts. (4 marks)

2b. Write the full meaning of S-R in the context of NAND-based latches (4 marks)

2c. What is the next state output, when the inputs are S=1 and R =1? (4 marks)

2d. What does the Output Qt+1 represent? (4 marks)

2e. Write the value of the output Q, when S = 0 and R = 1 (4 marks)

3. Microprocessors normally execute programs which include operating systems and user applications. List and describe the internal components of a typical microprocessor. (20 marks)

4. 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

4a.What does this table represent? (4 marks)

4b.State the key role of this table within the context of computer design. (6 marks)

4d.Draw a well-labelled diagram to depict the circuit implementation of this table. (10marks)

5a. Write down any four (4) forms of notations that can be used to capture the behaviour of finite-state machines. (4 marks)

5b. What does the acronym RAM represent? (2 marks)

5c. List the two (2) main types of RAM. (2 marks)

5d. Write short notes on the following:

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

[Total =12 marks]

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

i. mov al,8[ebx][esi*4] (4 marks)

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

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

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

6d. Name each of the fields in the statement you have provided. (4 marks)

7a. List and describe the three (3) main forms of flash memory operations. (16 marks)

7b. Write down the instruction required to move data from one segment of a

register ‘ecx’ to another ‘edx’. (4 marks)