NATIONAL OPEN UNIVERSITY OF NIGERIA
14-16 AHMADU BELLO WAY, VICTORIA ISLAND LAGOS
MARCH/APRIL 2016 EXAMINATION

SCHOOL OF SCIENCE AND TECHNOLOGY

COURSE CODE: **CIT344**
COURSE TITLE: **Introduction to Computer Design**

TIME ALLOWED: **3 Hours**
INSTRUCTION: Answer any five (5) questions

1a. Provide the corresponding binary number for each of the following decimal number:

i. 4
ii. 3
iii. 7) 2 marks each
iv. 5

(2 x 4 = 8 marks)

1b. From the standpoint of computer design, state 2 key operations performed on memories. (6 marks)

[Total = 14 marks]

2a. Give a brief explanation of how sequential circuits are implemented, using a well-labelled block diagram to illustrate this. (8 marks)

2b. Distinguish between the two (2) common types of sequential circuits. (6 marks)

[Total = 14 marks]

3a. Find the sum of the following 2-digit BCD numbers, 23 and 48. Your answer should be given in BCD. (8 marks)

3b. Name three (3) common forms of edge-triggered flip-flops employed in digital logic circuits. (6 marks)

[Total = 14 marks]

4a. Explain how a full adder can be built from half adders, using a well-labelled diagram to illustrate these facts. (10 marks)

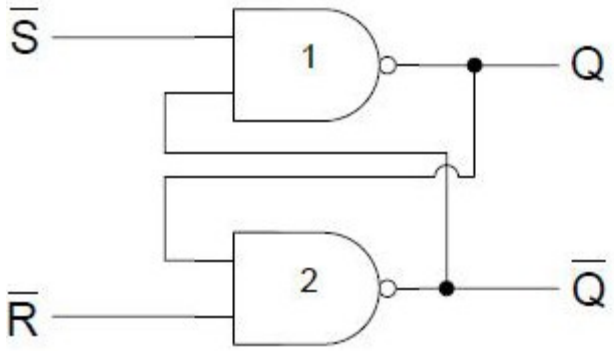
4b. Describe the term ‘Microprocessor” in computer design. (4 marks)

[Total = 14 marks]

5a. Write a simple program for declaring a CPU “fetch-execute” cycle. (10 marks)
5b. State any two (2) ways of analyzing a combinational logic circuit. (2 marks)

[Total = 14 marks]

6. Study the block diagram provided below and answer the questions that follow:



6a.Name the operation depicted in the diagram? (4 marks)
6b.Give a detailed explanation of how this operation is implemented. (10marks)

[Total = 14 marks]

7. Go through the source code provided below and answer the questions that follow:

```
Subroutine: push ax
push bx
.
.
pop bx
ret
.
.
call Subroutine
```

7a.The source code is error-free. True or False? Give a simple explanation for your answer. (4 marks)

7b.Write down the functions of the following instructions:

i. Initial Push instruction (2 marks)
ii. Second Push instruction (2 marks)
iii. Call instruction (4 marks)

(2 + 2 + 4 = 8 marks)

7c. Give the hexadecimal equivalent of 11010110101110010110 . (2 marks)

[Total = 14 marks]