

**NATIONAL OPEN UNIVERSITY OF NIGERIA**

**University Village, 91 Cadastral Zone, Nnamdi Azikwe Expressway, Jabi, Abuja**

**FACULTY OF SCIENCES**

**APRIL, 2019 EXAMINATIONS**

**COURSE CODE: CIT344**

**COURSE TITLE: Introduction to Computer Design**

**CREDIT: 3 Units**

**TIME ALLOWED: 2½ Hours**

**INSTRUCTION: Answer Question 1 and any other FOUR (4) Questions**

1a) Briefly explain the Repeated Division-by-2 method. ***(4 marks)***

 b) Convert 111010110101110010110 in binary to Octal ***(2 marks)***

 c) State the advantages of assembly language over high level languages. ***(4 marks)***

d) Compare the ASCII code and the Extended ASCII code ***(3 marks)***

e) Briefly explain the term combinational logic circuit. ***(2½ marks)***

f) Complete the Logic Function Generator based on 3-Variable Logic Function Table below: ***(2 marks)***

|  |  |
| --- | --- |
| **Input** | **Output** |
| **A** | **B** | **C** | **Y** |
| 0 | 0 | 0 |  |
| 0 | 0 | 1 |  |
| 0 | 1 | 0 |  |
| 0 | 1 | 1 |  |
| 1 | 0 | 0 |  |
| 1 | 0 | 1 |  |
| 1 | 1 | 0 |  |
| 1 | 1 | 1 |  |

g) State the following the Sum and the Carry-out Boolean expressions for a Full-Adder.

 ***(3 marks)***

h) List the three different types of edge-triggered flip-flops generally used in digital logic

 circuits. ***(1½ marks)***

2a) Briefly explain how a combinational logic circuit can be analysed and designed.

 ***(6 marks)***

b) What is a DeMUX? ***(2 marks)***

c) List two (2) forms of DeMUX. ***(2 marks)***

d) What is a Gray code? ***(2 marks)***

3a) What do you understand by the term ‘decoder’? ***(2 marks)***

b) Give the truth table and logic symbol of a 2-to-4 Decoder. ***(3 marks)***

c) Distinguish between Jumps and Loops ***(2 marks)***

d) List the five ways of modeling the behaviour of finite state machines ***(5 marks)***

4a) Enumerate any four different forms of Call instructions. ***(4 marks)***

b) State the functions of the **far** call instruction ***(4 marks)***

c) Briefly describe a sequencer, giving at least one example of a sequencer. ***(2 marks)***

d) Write short notes on Read and Write Signals. ***(2 marks)***

5a) State the functions of the **near** call instruction ***(3 marks)***

b) State the function of an edge-detector? How does it perform this function? ***(2 marks)***

c) Describe the Displacement-only addressing mode ***(5 marks)***

d) State four uses of Edge-Triggered J-K Flip-Flops. ***(2 marks)***

6a) State the two basic operations performed on memories and the signals typically used to support them. ***(6 marks)***

b) State the two major functions of a register. ***(2 marks)***

c) Outline four of the different forms of shift operations of a register. ***(4 marks)***