ELIZADE UNIVERSITY, ILARA-MOKIN, ONDO STATE

FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

FIRST SEMESTER EXAMINATION, 2020/2021 ACADEMIC SESSION

COURSE TITLE: COMPUTER ORGANISATION AND ARCHITECTURE

COURSE CODE: ECE 511

COURSE UNIT(S): 3 UNITS

EXAMINATION DATE: MARCH, 2021

COURSE LECTURER: ENGR. ISAAC ELESEMOYO

ENGR. OYEYEMI OYEWOLE

HOD's SIGNATURE

TIME ALLOWED: 2 HOURS 30 MINUTES

INSTRUCTIONS:

1. ANSWER FOUR QUESTIONS ONLY
2. SEVERE PENALTIES APPLY FOR MISCONDUCT, CHEATING, POSSESSION OF UNAUTHORIZED MATERIALS DURING EXAM.
3. YOU ARE **NOT** ALLOWED TO BORROW ANY WRITING MATERIALS DURING THE EXAMINATION.

Question 1

a. List and explain with examples five of the different addressing modes [10 marks]
b. Explain the function of the following:
   i. IR ii. MAR iii. CU iv. ALU v. MDR. [5 marks]

Question 2

a. Give a full description of an INTEL 8086 computer architecture. [6 marks]
b. Compare and Contrast CISC and RISC [4 marks]
c. With proper illustration, explain the five-stage CPU instruction pipeline for the execution of a program that contains eight instructions. [5 marks]

Question 3

a. A cache is much more faster than the main memory but much more smaller. A large amount of memory is needed to host data for CPU operation, and a faster memory is needed for the CPU operations. Explain the reason why Engineers prefer to have small cache when they can have large cache and no memory. [5 marks]
b. What are the differences between EPROM and EEPROM? [4 marks]
c. State the categories of external devices with examples. [6 marks]

Question 4

a. List and explain each of the user visible registers available [8 marks]
b. List and explain the main function of an I/O module. [5 marks]
c. What are the functions of the CU and the ALU? [2 marks]

Question 5

a. Explain each of the following processor interconnection Network topology
   i. Single Bus
   ii. Crossbar Network
   iii. Multistage Network
   iv. Hypercube Network
   v. Mesh Networks [10 marks]
b. Describe the internal structure of the Processor. [5 marks]

Question 6

a. The Microprocessor has a pin labelled $IO/\overline{M}$. What is the function of the pin? when and how is it used? [2 marks]
b. Given the following control codes for a three-bit control lines $C_2C_1C_0$: 000, 001, 010, 011, 100, 101, 110, 111. What function will the ALU carry-out given these codes? [8 marks]
c. Given the following expression in binary to the CPU, what output will the ALU return?

i.	11010	010	10101
ii.	1011	011	1000
iii.	1010110	000	1101101
iv.	1010	100	1111
v.	1011	101	1001

[5 marks]