**NATIONAL OPEN UNIVERSITY OF NIGERIA**
**91 CADASTRAL ZONE, NNAMDI AZIKWE EXPRESSWAY, JABI, ABUJA**
**FACULTY OF SCIENCES**
**DEPARTMENT OF COMPUTER SCIENCE**

**2022_2 Examination**

**COURSE CODE: CIT411**
**COURSE TITLE: MICROCOMPUTERS AND MICROPROCESSORS**
**CREDIT: 2 Units**
**TIME ALLOWED: 2 Hours**
**INSTRUCTION: Answer Question ONE (1) and any other THREE (3) Questions.**

**Question 1**

a. Assume that x86 microprocessors' Registers R1, R2, and R3 have the values 0FFh, 0Feh, and 0EDh respectively. Calculate the results of the following operations. (***5 marks)***

| **SN** | **OPERATION** | **RESULT** |
|---|---|---|
| i | ADD R1, #1 | |
| ii | INC R3 | |
| iii | PUSH R1 | |
| iv | DEC R2 | |
| v. | SUB R2, #1 | |

b. Compare Immediate and Register addressing mode of 8085 microprocessor. ***(5 marks)***
c. Assess the application of microprocessors in Embedded Controllers? (***5 marks)***
d. Arrange the functions of Flags in 8085 microprocessors ***(7marks)***
**e**. Compare Direct and Indirect addressing modes of 8085 microprocessor ***(8 marks)***

**Question 2**
a. Compare x64 with x86 microprocessor ***(5marks)***
b. Examine the microcomputer and microcontroller. ***(5marks)***
**c.** Compare integer and real data types employed in microprocessors ***(5 marks)***

d. Describe the Arithmetic Logic Unit (ALU) of 8085 microprocessor ***(5 marks)***

**Question 3**

3a. Examine the fields in the coprocessor instruction. *(2 marks)*

b. Identify four (4) microprocessor interface components. **(*4 marks*)**

c. Contrast the hardware Characteristics of Reduced Instruction Set Computer (RISC) with Complex Instruction Set Computer (CISC). **(6 marks)**

d. State and analyze the format of assembly language instruction ***(8 marks)***

**Question 4**

4a. Assess the performance of Dual-core and Quad-core processors. ***(5 marks)***

b. Explain the functions of the Architecture of the Harvard microcomputer ***(5marks)***

c. Discuss four (4) technological innovations of microprocessors. ***(5marks)***

d. Describe a coprocessor? ***(5 marks)***

**Question 5**

5a. Examine the Registers in 8085 microprocessors (***5 marks)***

b. Appraise the application of microprocessors in Digital Signal Processing **(7 marks)**

**c**. Compare Problem Analysis and Design stages in developing an efficient program ***(8 marks)***