



**ELIZADE UNIVERSITY, ILARA-MOKIN, ONDO
STATE
FACULTY OF ENGINEERING
DEPARTMENT OF COMPUTER ENGINEERING**

FIRST SEMESTER EXAMINATION, 2019/2020 ACADEMIC SESSION

COURSE TITLE: COMPUTER ORGANISATION AND ARCHITECTURE

COURSE CODE: ECE 511

EXAMINATION DATE: FEBRUARY, 2020

COURSE LECTURER: ENGR. ISAAC ELESEMOYO

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HOD's SIGNATURE

TIME ALLOWED: 3 HOURS

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. Explain the function of the following:
i. CU ii. MAR iii. PC iv. AC v. MDR. [5 marks]
- b. 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. [4 mark]
- c. What do you understand by the word interrupt? [1 mark]
- d. Give a full description of an 16-bit computer architecture. [5 marks]

Question 2

- a. Compare and Contrast CISC and RISC [4 marks]
- b. With proper illustration, explain the five-stage CPU instruction pipeline for the execution of a program that contains eight instructions. [5 marks]
- c. Discuss the following [6 marks]
i. Serial Interface ii. Parallel Interface iii. Fire Wire

Question 3

- a. Discuss computer system memory hierarchy and explain why the computer needs to utilize a memory hierarchy. [4 marks]
- b. List and explain the three of the different addressing modes [3 marks]
- c. What are the differences between SDRAM and DDR-RAM? [2 marks]
- d. State the categories of external devices with examples. [6 marks]

Question 4

- a. What are the reasons why I/O device is not directly connected to the system bus? [5 marks]
- b. List and explain the main function of an I/O module. [5 marks]
- c. What are the types of I/O addressing modes and how do they function? [3 marks]
- d. The Microprocessor has a pin labelled IO/\bar{M} . What is the function of the pin? when and how is it used? [2marks]

Question 5

- a. With the aid of a diagram, discuss the similarities and differences between a Von Neumann and a Harvard architecture Computer. [10 marks]
- b. Describe the internal structure of the Processor. [5 marks]

Question 6

- a. What are the functions of the CU and the ALU? [2 marks]
- b. Given the following control codes for a three-bit control lines: 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 111 1001 [5 marks]