



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI-ABUJA
FACULTY OF COMPUTING
DEPARTMENT OF COMPUTER SCIENCE
2025_1 EXAMINATION...

COURSE CODE: CIT312

COURSE TITLE: Computer Architecture and Organization

CREDIT: 3 Units

TIME: 3 Hours

INSTRUCTION: Answer Question ONE (1) and any other THREE (3) Questions

Question 1

- 1a. Highlight two (2) Disadvantages of Microprogrammed Control Unit. **(1 Mark)**
- 1b. Discuss by highlighting seven (7) key points about Magnetic Disk Storage. **(7 marks)**
- 1c. Examine Five (5) known limitations of Asynchronous Controllers. **(5 Marks)**
- 1d. Discuss how fault-tolerant architectures can be used to address circuit reliability concerns. **(12 marks)**

Question 2

- 2a. Examine the core components of a critical system to improve fault tolerance. **(4 marks)**
- 2b. Discuss cache memory in computer architecture. **(5 Marks)**
- 2ci. Define Registers and describe two forms of registers. **(4 Marks)**
- 2cii Give two (2) examples of Registers you defined in (i) and highlight their function. **(2 Marks)**

Question 3

- 3a. Examine when Replacement Algorithm is useful. **(2 marks)**
- 3b. The **one-address** instruction **ADD R1** = the **three-address** instruction **ADD R1,Racc,Racc** or to the **two-address** instruction **ADD R1,Racc**. How? **(3 marks)**
- 3c. Discuss the basic characteristics of fault tolerance systems. **(10 marks)**

Question 4

- 4a. Assemblers are programs that generate machine code instructions from a source code program written in assembly language. Highlight the functions of assemblers. **(3 Marks)**
- 4b. Discuss the issues associated with hardware and software fault tolerance. **(5 marks)**
- 4c. With the aid of a well-labelled diagram, discuss the process of **Handshaking** in Asynchronous buses. **(7 Marks)**

Question 5

- 5a. What is a Redundancy in fault tolerant systems? **(2 marks)**
- 5b. Highlight the components of the 16-bit registers in a simple accumulator-based processor. **(4 Marks)**
- 5c. Discuss three (3) main methods through which data can be transferred to and from the peripherals. **(9 Marks)**

Question 6

- 6a. Identify two basic techniques to increase the instruction execution rate of a processor. **(2 Marks)**
- 6b. Highlight three (3) motivations of parallel processing. **(3 marks)**
- 6c. Discuss two (2) forms of redundancy in fault tolerant systems. **(10 marks)**