

**MOSHOOD ABIOLA POLYTECHNIC, ABEOKUTA**

**DEPARTMENT OF COMPUTER SCIENCE**

**2023/2024 1ST SEMESTER EXAMINATIONS**

**Course Code: COM 314**

**Time Allowed: 3hrs**

**Course Title: COMPUTER ARCHITECTURE (3 UNITS)**

**Class (es) writing the Paper: HND I COMPUTER SCIENCE (FT & PT)**

**Instructions- Answer any FIVE questions, each question carry (20 marks).**

1a. Define a register?

b. Write the four storage functions of a register.

*Process  
Process*

c. Describe the fundamental Principles that are applicable to the various types of CPU (20 mks)

2a. Explain the function of a Bus as related to Computer Architecture.

b. Write short note on the following:

i) Communication Protocol    ii) Asynchronous Protocol    iii) Synchronous Protocol

c. Mention the three internal components that the Control Units directs. (20 mks)

3a. Describe the following Parallel Processor System:

i) SISD    ii) SIMD    iii) MISD    iv) MIMD

b. Define the following terms:

i) Access Time    ii) Latency<sup>+</sup>    iii) Memory Cycle Time    iv) Transfer Rate

c. Distinguish between Hard Failures and Soft Error. ✓ (20 mks)

4a i) Describe an Interrupt.    ii) Explain the two types of an Interrupt.

b. Explain fully an Instruction Cycle, sketch appropriate diagram where necessary.

c. Distinguish between Memory Cache and Disk Cache. ✓ (20 mks)



5 a. Describe the basic concept of Von Neumann Architecture.

b. Write two problems of Von Neumann Architecture.

c. State three methods/techniques that could be applied to overcome the problems that are associated with Von Neumann Architecture. ✓ (20 mks)

6a. Write short note on the following functional units in a computer system:

i) Control Unit

ii) Arithmetic Logic Unit

iii) Accumulator

iv) Program Counter

(20 mks)

7. Write short note on the following Access Method as related to the capacity of external memory:

i) Direct Access

ii) Sequential Access

iii) Associative Access

iv) Radom Access

(20 mks)

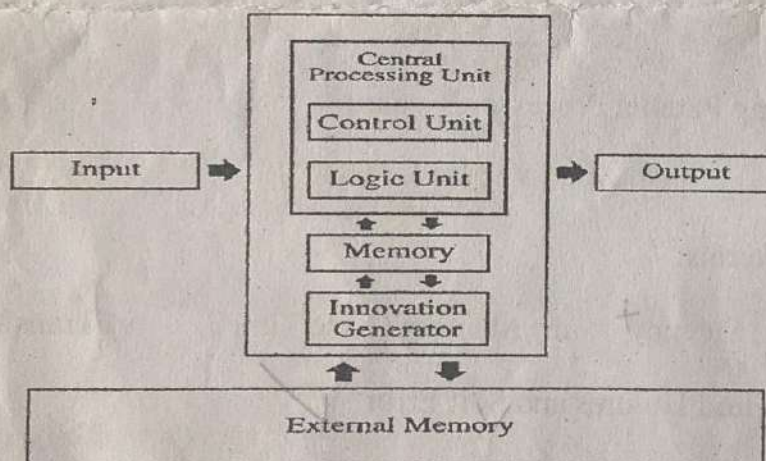
**SECTION 2** *one* **ATTEMPT ANY TWO QUESTIONS FROM THIS SECTION**

1ai. Explain the differences between Von Neumann and Harvard architectures. (2marks)

1aii. Explain the role of I/O devices in computer systems and how they interface with the CPU. (4marks)

1aiii. Explain the role of the control unit in managing the execution of instructions. (4marks)

1bi. Explain the function of the labeled part in the diagram below (7marks)



*Processor  
Processor*

1bii. Explain the differences between RAM and ROM. (3marks)

**QUESTION 2**

2ai. What is an Instruction Set Architecture (ISA), and why is it important? (3marks)

2aii. Explain the differences between data bus, address bus, and control bus. (5mark)

2aiii. Describe the steps involved in the fetch-decode-execute cycle. (3marks)

2bi. Explain the role of the control unit in managing the execution of instructions (5marks)

2bii. What are the benefits and challenges of using a superscalar architecture? Mention Four (4).