

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.

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⁺ 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)

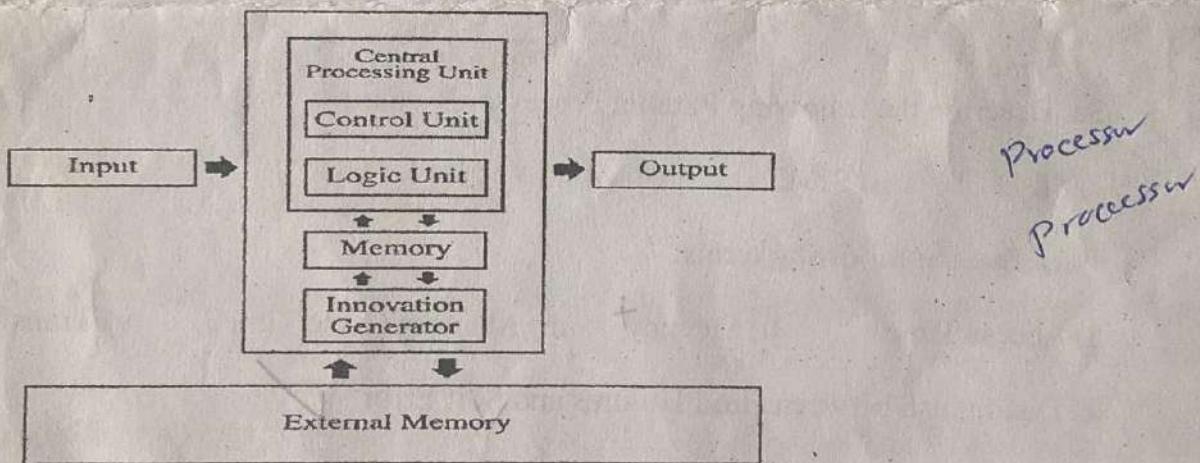
- 5 a. Describe the basic concept of Von Neumann Architecture.
- b. Write two problems of Von Neumann Architecture.
- c. State three methods/techniques that could be applied to overcome the problems that are associated with Von Neumann Architecture. ✓ (20 mks)
- 6a. Write short note on the following functional units in a computer system:
- Control Unit
 - Arithmetic Logic Unit
 - Accumulator
 - Program Counter
- (20 mks)

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

- Direct Access
 - Sequential Access
 - Associative Access
 - Random Access
- (20 mks)

One
SECTION 2 ATTEMPT ANY TWO QUESTIONS FROM THIS SECTION

- Explain the differences between Von Neumann and Harvard architectures. (2marks)
- Explain the role of I/O devices in computer systems and how they interface with the CPU. (4marks)
- Explain the role of the control unit in managing the execution of instructions. (4marks)
- Explain the function of the labeled part in the diagram below (7marks)



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

QUESTION 2

- What is an Instruction Set Architecture (ISA), and why is it important? (3marks)
- Explain the differences between data bus, address bus, and control bus. (5mark)
- Describe the steps involved in the fetch-decode-execute cycle. (3marks)
- Explain the role of the control unit in managing the execution of instructions (5marks)
- What are the benefits and challenges of using a superscalar architecture? Mention Four (4).