



NATIONAL OPEN UNIVERSITY OF NIGERIA

University Village, Plot 91, Cadastral Zone,
Nnamdi Azikiwe Expressway, Jabi, Abuja

FACULTY OF SCIENCES
2023_2 EXAMINATIONS

Course Code: CIT711

Course Title: Computer Fundamentals

Time Allowed: 2hrs/30mins **Credit Units:** 3

Instruction: Answer Question one (1) and any four (4) others Questions.

1.
 - a. Explain what you understand by Sequential access memory and give an example of a device using the technology (**3 marks**)
 - b. Discuss how caches are used to enhance the performance of a computer system benefit. (**3 marks**)
 - c. Explain what you understand by pipelining in computer Architecture (**2 marks**)
 - d. Differentiate between Parallel Processing and pipelining (**2 marks**)
 - e. Explain what you understand by Loop statement and give an example of real-life problem where the construct can be used (**4 marks**)
 - f. Discuss why devices are not directly connected to the computer system bus and explain the function of input/output module interface in a computer system (**4 marks**)
 - g. Explain the following concepts:
 - i. System software (**2 marks**)
 - ii. Application software (**2 marks**)

2.
 - a. Normally the C.P.U is much faster than the main memory. However, the execution of the program, the CPU must reference memory several times. This normally slow down the execution of a program. Discuss how this performance lost can be minimized using Cache. (**6 marks**)
 - b.
 - i. Assume that you have a machine where the processor access words from the main memory directly. If the main memory access time is 100ns, how long will it take the machine to execute 100 memory references. (**3 marks**)
 - ii. Assume that an enhancement has been introduced in the machine in (i) above by introducing a cache with access time of 2ns. Upon a cache miss, a block containing the requested word was transferred to the cache from the main memory in 200ns. If words in that blocks are accessed 100 times in the cache, what is the total memory access time? (**3 marks**)

3.
 - a. Describe the following category of Parallel architecture
 - i. Data flow Architecture (**3 marks**)

- ii. Array processor (*3 marks*)
 - b. Discuss the reasons that guided the development of complex instruction set computers (CISC). (*6 marks*)
- 4.
- a. Discuss the functionality of the following Types of Operating System
 - i. Batch Operating system (*2 marks*)
 - ii. Real time Operating system (*2 marks*)
 - iii. Distributed Operating System (*2 marks*)
 - b. Describe how I/O buffering is normally used to improve the performance of a computer system (*6 marks*)
- 5.
- a. Discuss the following concepts related to data communication and for each of them, give an example of a device which may likely use the medium.
 - i. **Simplex** (*2 marks*)
 - ii. **Half-duplex** (*2 marks*)
 - iii. **Full Duplex Communication** (*2 marks*)
 - b. Briefly describe the characteristics of the following Communication Channels.
 - i. Coaxial cable (*2 marks*)
 - ii. Twisted Pair Cable (*2 marks*)
 - iii. Optic fibre (*2 marks*)
- 6.
- a. Hacking into network systems is not the only way that sensitive information can be stolen or used against an organization. Physical security must be implemented correctly to prevent attackers from gaining physical access and take what they want. Suggest ways by which physical security can be implemented. (*4 marks*)
 - b. Explain what is Software security and suggest ways for minimizing software security threats (*4 marks*)
 - c. John is working on a loop that will print the statement "I AM HAPPY" 100 times within a program. Write the for-loop statement to achieve that (*4 marks*)