Subject code: PC404EC Semester: 2nd

Subject name: Computer Organisation & Architecture ACY: 2021-2022

Assignment Questions

1. Elaborate on the significance of fixed-point representation of numbers in computer systems. Provide examples to support your explanation.
2. Describe the digital arithmetic algorithm for multiplication using Booth's algorithm. Provide a step-by-step walkthrough of the process.
3. Discuss the algorithms for addition and subtraction in the context of digital arithmetic and their importance in computer systems.
4. Provide an overview of computer instructions, highlighting their types and functions. How do computer instructions contribute to the execution of programs?
5. Explain the components and steps involved in the instruction cycle, focusing on the Fetch and Decode stages. How does the instruction cycle contribute to the execution of instructions?
6. Discuss the configuration and instructions related to input, output, and interrupts in computer systems. How do interrupts enhance the functionality of a computer system, and what is the role of program interrupt in this context?
7. Elaborate on the stack organization in computer systems. How is it used for data storage and retrieval, and what role does it play in program control?
8. Discuss the basics of vector processing and array processors. How do these concepts contribute to efficient data manipulation in parallel processing environments?
9. Explain the concept of pipeline processing, focusing on instruction pipelines. How does pipelining enhance the speed and efficiency of instruction execution in a CPU?
10. Discuss the various modes of data transfer, including programmed I/O, interrupt-driven I/O, and priority interrupt. How do these modes enhance the efficiency of input/output operations in a computer system?
11. Explore the concept of Direct Memory Access (DMA) and its role in data transfer. What is the function of a DMA controller, and how does it optimize the transfer of data between external devices and memory?
12. Define an Input-Output Processor (IOP) and elaborate on the communication between the CPU and IOP. How does the I/O channel contribute to efficient data transfer and processing?
13. Describe the concept of virtual memory and its role in addressing memory limitations. How is address mapping achieved using pages in virtual memory systems?
14. Explain the fundamentals of associative memory and its use in computer systems. How does associative memory contribute to fast data retrieval?
15. Discuss the importance of memory management in computer systems. What are the key challenges associated with memory management, and how are they addressed in modern computing environments?