BT-5/D-23   45172

COMPUTER ORGANIZATION & ARCHITECTURE
PC-CS-307 A

Time : Three Hours]   [Maximum Marks : 75

Note : Attempt *Five* questions in all selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) What are the key principles of Von Neumann architecture, and how do they influence the design of modern computers ?   8

    (b) Describe the Booth's algorithm for binary multiplication ?   7

2. (a) Compare restoring and non-restoring algorithms for binary division. What are their advantages and disadvantages ?   10

    (b) What is memory hierarchy, and why is it important in computer systems ?   5

Unit II

3. What do you mean by instruction cycle ? Differentiate between register reference instructions and memory reference instructions. Provide examples of each.   **15**

4. (a) What is Interrupt ? Explain interrupt cycle with the help of flow chart.   **8**

   (b) Explain the concept of a microprogrammed control organization.   **7**

Unit III

5. Discuss various addressing modes commonly used in CPU instruction sets. How do different addressing modes impact program efficiency ?   **15**

6. (a) Explain the fundamental features of CISC and RISC architectures. Compare the two architectures.   **10**

   (b) Describe the concept of pipeline processing in CPU design.   **5**

Unit IV

7. What is Direct Memory Access (DMA), and how does it offload data transfer tasks from the CPU ? Describe the role of a DMA controller in this process.   **15**

8. (a) Compare programmed I/O and interrupt-driven I/O. What are the advantages and disadvantages of each method ? **8**

   (b) Differentiate between the I/O bus and the memory bus. What are the key distinctions in their functions and usage ? **7**