

Computer Architecture & Organization

Unit-1:

1. a). Discuss various functional units of computer.
b). What is a bus? Draw the figure to show how functional units are interconnected using a bus and explain.
2. a). Represent the number $(+46.5)_{10}$ as a floating point number with 24 bits. The normalized fraction mantissa has 16 bits and exponent has 8 bits.
b). Define performance of the system? Explain about the parameters that affect the performance of a system.
3. Explain the following with examples each:
 - (i) Fixed point representation
 - (ii) Integer representation
 - (iii) Floating point representation.
4. a). Explain about the binary multiplication algorithm using 2's complement data.
b). Multiply $3 \times (-7)$ using Booth multiplication algorithm

Unit-2:

1. a). What is Register transfer language? Explain.
b). Explain various instruction formats using address fields
2. a). Explain about the following:
 - (i) Arithmetic Micro-operations
 - (ii) Logical Micro-operations
 - (iii) Shift Micro-operations
3. Define instruction cycle. Explain the fetch and decode cycles for a register transfer statements show how the register transfer statements are implemented in the bus system. Draw the flowchart for instruction cycle.
4. a). What is the need for various addressing modes? Explain various addressing modes with example?
b). Explain about the stack organization in detail.

Unit-3:

1. Explain the following
 - (i) Control memory
 - (ii) Address sequencing
2. Draw the micro program control organization and explain each block.
3. Explain the following:
 - (i) Micro operation
 - (ii) Microinstruction
 - (iii) Micro program
 - (iv) Microcode

4. a). Explain the design of hardwired control unit.
- b). Write short notes on micro instruction sequencing.

Unit-4:

1. a). Discuss about memory hierarchy in a computer system with regard to speed, size and cost.
- b). Give at least four differences between a magnetic-drum and a magnetic-tape unit.
2. Explain the three types of mapping procedures related to cache memory organization at length.
3. What is Associative memory? Why it is faster than main memory? Explain its hardware organization.
4. What is Associative memory? Why it is faster than main memory? Explain its hardware organization.

Unit-5:

1. Write notes on following:
 - (i) Programmed I/O
 - (ii) Interrupt driven I/O
 - (iii) Serial Communication
2. How is data transmitted between main memory & secondary memory using DMA?
3. a). Explain the Input Output Processor in detail.
- b). Describe an asynchronous data transfer using strobe & hand shaking with the help of timing diagram.
4. Explain about the following:
 - (i) Peripheral Devices
 - (ii) Input-Output Interface.

Unit-6:

1. a). Explain the vector processing in detail.
- b). Explain the characteristics of multiprocessors.
2. Explain in detail various Interconnection Structures
3. a). Mention and explain the problems in parallel processing.
- b). What is RISC? Distinguish RISC and CISC processors.
4. Explain the following:
 - (i) Characteristics of multiprocessors
 - (ii) Problems in parallel processing